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THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 35 APRIL, 1934 No. 1

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No. 25

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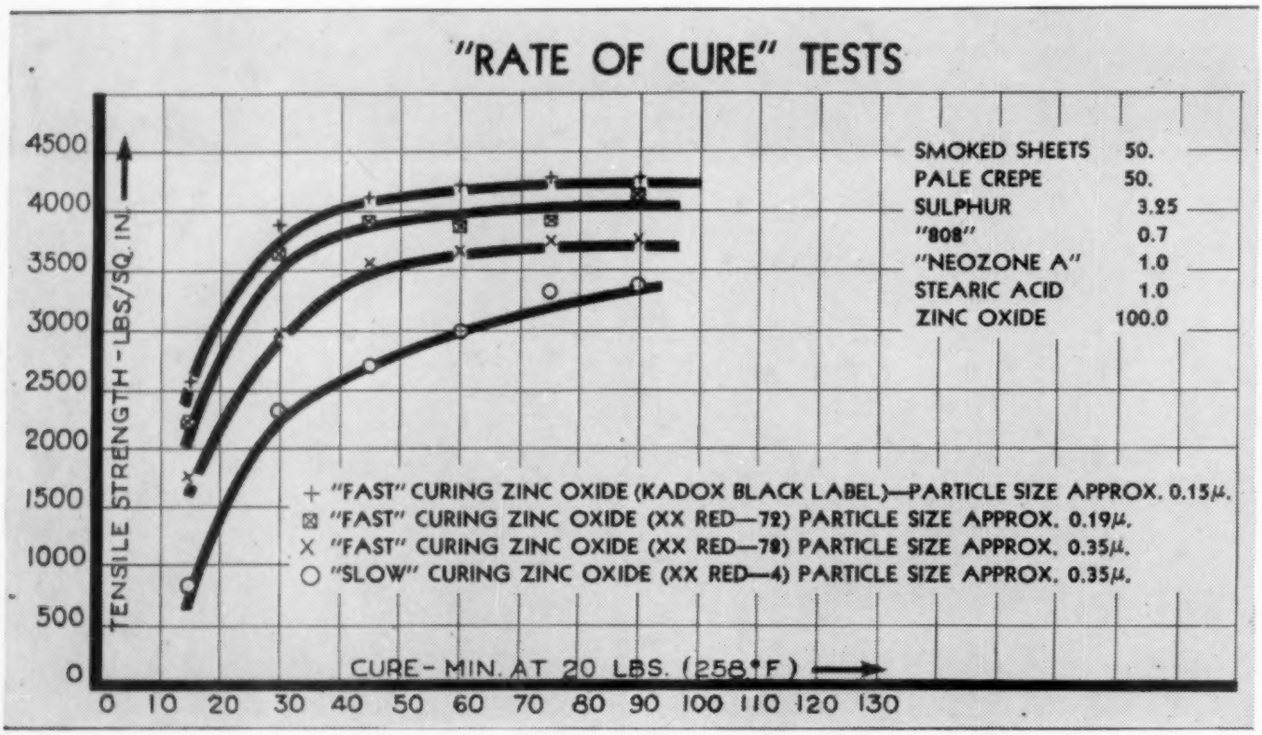
"RATE OF CURE" TESTS
TENSILE STRENGTH - LBS./SQ. IN.
4500
4000
3500
3000
2500
2000
1500
1000
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0
SMOKED SHEETS 50.
PALE CREPE 50.
SULPHUR 3.25
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THE RUBBER AGE

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TORNESIT—A Chlorinated Rubber Base for Protective Coatings

Interesting Results Have Been Obtained with This New Compound from Germany Under Severe Conditions

By R. A. COOLAHAN
Hercules Powder Company, Inc., Wilmington, Del.

DETAILS of research work on chlorinated rubber were described in the December, 1933, issue of THE RUBBER AGE by Dr. C. A. Redfarn, who expressed the opinion that, despite early over-publicizing, this new type of compound may find a useful place in industry. Since that time Dr. Wilhelm Krumbhaar, former head of the Paint and Varnish Institute in Germany and now vice-president of Beck, Koller & Company, Inc., Detroit, Mich., has discussed the subject before many groups of paint and varnish men in this country, calling particular attention to the limited practical uses of paints with a chlorinated rubber base. The Hercules Powder Company, however, has found that one type of chlorinated rubber, properly compounded, has very definite uses in certain applications and is marketing it in the United States under the name of Tornesit. (EDITOR)

THE explanation of the name of Tornesit is found in the place where it was first made: namely, Tornesch, Germany. Before going into a description of the product and the hopes we entertain for it, I would like to explain our connection and interest in it.

Early in 1931 our European representatives first brought to our attention a chlorinated rubber of German origin which, unlike many earlier products of its kinds, is unusually stable though very highly chlorinated. Moreover, it showed considerable possibilities of even further improvements.

The properties that particularly appealed to us were its great resistance to chemical action and, more especially, its extraordinary adhesion to metal. This latter property is obtained without sacrificing hardness. As a matter of fact, of all the protective coatings we have tested, Tornesit appears to be easily outstanding in this respect. Samples of varying viscosities were imported and tested in our laboraties. The original claims and promises held out for it were, in our opinion, confirmed with the result that about six months ago we signed an agreement giving us exclusive rights in the United States of America and in American possessions under numerous product and process patents held by The Chadeloid Chemical Company of New York; and the New York Hamburger Co., and Deutsche Tornesit Gessellshaft of Germany.

Last fall some of our chemists and engineers spent con-

siderable time in Germany studying the process in operation near Hamburg and otherwise preparing themselves to enable us to construct an improved manufacturing unit in this country. Since their return, these studies have been diligently pushed with the result that already we are prepared to say that when we begin manufacturing operations —we hope before the end of this year—we can be certain of an improved product over what is now being offered. In connection with this statement, it might be well at this point to discuss the appearance of the product.

The product now being imported from Germany is a yellowish-white powder which, when made into a 20% Toluol solution, has a dark amber color as indicated by typical samples. Our initial manufacturing efforts on a laboratory scale during the past month confirmed our early conviction that the physical properties could be greatly improved as these samples clearly show. The product—in this case a white fluffy material—is white in the solid state and odorless. When made into a 20% Toluol solution and filtered, it gives a product almost equal in color to Nitrocellulose solutions. Tests indicate that the color of a Tornesit solution is traceable to contamination and to the present method of processing. By guarding against contamination, there is a good chance of improving its stability and almost eliminating its present color without altering its basic and fundamental properties. Tornesit in the new form is much more readily soluble.

Though this sample was produced in the laboratories, it is well to point out that technical grades of materials and a type of equipment were employed which will be used in production. We can conservatively say, therefore, that the improved material will closely approach the lighter rather than the darker samples.

Product Is Available Commercially

Tornesit is available commercially in viscosities ranging from 6 to 1000 centipoises, and even higher viscosities are in prospect. The highest viscosity types are indicated for the thermoplastic field—it molds well in the presence of solvent plasticizers.

The type in which we are chiefly interested is 130 cps. viscosity material for general paint work. The viscosity was determined on a 20% solution in Toluol with the capillary viscosimeter at 25 degrees Centigrade. This material closely parallels the viscosity of RS ¼ second Nitrocellulose in a fifty-fifty mixture of butyl acetate and toluol.

Tornesit is a non-flammable, non-combustible, stable, chemically inert, highly chlorinated rubber product with a resin-like nature and is practically odorless. At temperatures up to 100°C. it is very stable. Decomposition becomes progressively greater as the temperature is increased, but this does not become really serious unless a temperature exceeding 135°C. is maintained for a long period. At 150°C. Tornesit begins to char. Its specific gravity is 1.5. Samples of Tornesit paint have been stored in tin cans at 40°C. for fifteen months with no noticeable corrosion and no evidence of gas pressure being developed. Moreover, it is very stable to the action of dilute and concentrated acids and alkalis.

Tornesit is soluble in a number of solvents, the most practical ones being the coal tar hydrocarbons. Hercolyn and the chemical plasticizers are compounded with Tornesit for service in alkali atmospheres. For acid conditions, blown linseed oil and properly bodied wood oil are the most practical plasticizers. Amberols, the coumarone-indene and certain dulux resins, and ester and damar gums are used with advantage. A fairly wide range of pigments have been used in Tornesit films for outdoor exposure, and specialty paints. Those actually tested include zinc oxide, lithopone, titanox, carbon black, bone pitch, oil black, chrome yellow, chrome green, Prussian blue, toluidine red, various grades of iron oxide and red lead. Prussian blue, chrome green, chrome yellow, red lead and lithopone fade and discolor considerably. Bone pitch does not produce gas as it does in Nitrocellulose lacquers.

Formulas with these pigments have been exposed to weathering conditions for from 1½ to 2 years. These films to date afford excellent protection for the metal and can be polished to a good surface. Coatings pigmented with toluidine red showed the least amount of fading and in general gave best results. A 100% Tornesit film was compared with a Nitrocellulose-damar gum film by exposing them through glass to ultra-violet irradiation. The discoloration of the Tornesit film was no greater than the Nitrocellulose-damar gum combination film. A third Nitrocellulose film containing an ester gum was badly discolored in this test.

Has Good Di-electric Properties

Both clear and pigmented Tornesit films have been tested for insulating values. Clear Tornesit has especially good di-electric properties. In fact, as good as anything we have tested and these properties are retained in the presence of moisture. Plasticized films are also very good in this respect so far as they have been tested. The lowering of the di-electric strength depends on the type and particle size of the pigment added, small particle size being best.

Tornesit is quickly dissolved if added to its solvents so that all becomes wet before any appreciable quantity goes into solution. In a large scale operation, this is effected by adding Tornesit to the solvents with rapid stirring. If Tornesit is charged in the mixture first and solvents added, considerable difficulty will be encountered in effecting solution.

Clear Tornesit films are very resistant to chemical action, but unless properly compounded are brittle and have poor adhesion. To maintain its chemical resistance and to get good adhesion and flexibility, the following suggestions are offered. Brittleness is avoided by the intelligent selection and use of plasticizers. The usual ester type of plasticizers are more susceptible to saponification and hydrolysis than are the hydrogenated alkyl esters of abietic acid, like Hercolyn. Therefore, Tornesit formulas containing dibutylphthalate, for example, are more easily attacked than those containing Hercolyn. Accordingly, for severe alkali conditions, Hercolyn is recommended. For moderate conditions, the ester type of plasticizers are quite satisfactory. The most economical plasticizers for acid resistance and ordinary exposure are the drying oils. The only objection to Hercolyn is that its plasticizing power in Tornesit formulations is not great. A more brittle film results than when chemical plasticizers or the drying oils are employed.

Certain Limitations Are Conceded

No paint, varnish or lacquer is perfect in all respects. From your own formulating experiences you know you must constantly weigh the value of one property against another—give and take. In formulas where Hercolyn is employed, flexibility is sacrificed to a degree to gain very remarkable alkali resistance and water impermeability. Here I would like to make it plain that a clear Tornesit film, like a clear Nitrocellulose lacquer, has many applications but is not intended for use outdoors. As stated earlier in the evening, our more than two years experience with this product furnishes convincing evidence of the unusual and useful properties of properly formulated pigmented Tornesit paints. Here again emphasis can be laid on its chemical resistance, but its equally outstanding property is its adhesion.

(Continued on page 26)

Modern Fire Control For the Rubber Factory

Complete Automatic Protection Is Now Available To Guard the Safety of the Manufacturing Plant

By PAUL W. KEARNEY

NOT long ago a Massachusetts rubber factory had a fire, the story of which is interesting because it demonstrates so many things so graphically.

The plant consisted of twelve buildings, and practically all of these were completely sprinklered except Building No. 8. The plant also employed a conscientious and dependable night watchman. His route of patrol had been laid out by his superiors and he followed it faithfully. Outside of Building No. 8 was one of the stations where he registered on his clock, but this was a storehouse, barred and bolted at night, and he was not supposed to enter it. It is doubtful, indeed, that he could have got inside had he wanted to.

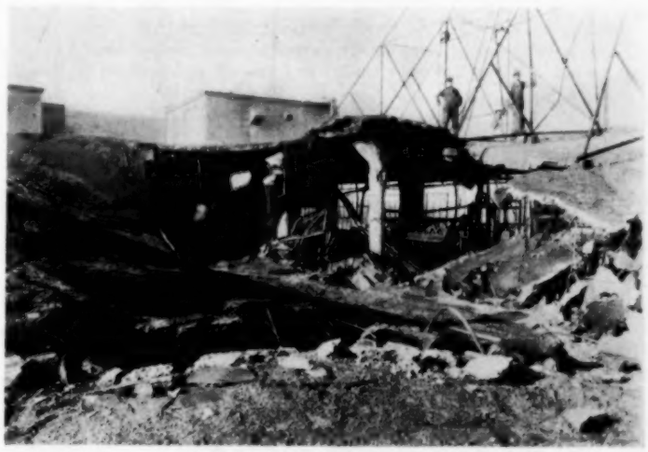
Be that as it may, the watchman rang in at No. 8 at 3 A. M., and went on with the remainder of his round. Normally he wouldn't get back to that point until four o'clock, and from at least four-fifths of the route he traversed in the interim, his view of this particular storehouse was obstructed by intervening buildings.

In the light of all these particulars, then, it is quite understandable that a fire, originating in this unprotected, uninspected structure, grew to such proportions before detection that it was actually discovered a few minutes before 4 A. M., by men on the night shift of another plant a quarter of a mile away! They had just finished telephoning the fire department when the watchman himself rounded the corner of an adjoining building, saw No. 8 glowing from ground to rafters, and snapped the fire alarm box in the yard.

The conclusion of the story is written in terms of a

Where Fires Are Reported

. . . operators are always on duty at this typical central station to watch for signals from protective systems and to transmit fire alarms



This Was a Fireproof Factory

. . . but the result shown occurred when fire starting in rubber cement got out of control. Only prompt detection can stop such disasters

$250,000 loss because the sprinklers in adjacent buildings were naturally not able to cope with such a roaring conflagration as this. And as a sort of ironic anti-climax, we might add that while the blaze was doing its worst, plans for the installation of a sprinkler unit in Building No. 8 were reposing on the president's desk awaiting his O. K.!

This is no salesman's bogey-man tale of what might occur—it is a direct story from the records of a fire inspection agency what *did happen*. And while any elaboration of those glittering facts would be a shameful gilding of the lily, it can do no harm to emphasize the full significance of some of them.

First of all, no protection is full protection unless it is complete. This sounds trite, yet it is amazing to go through the records of "sprinkler failures" year after year and see how many of them occur in plants that are only partially sprinklered. With a perversity peculiar to itself, the fire elects to start in one of those unprotected spots where it gathers volume and fury enough to thwart the sprinklers when it extends to the protected areas. For after all, automatic sprinklers are intended for use on incipient outbreaks, not full-fledged conflagrations.

Sprinkler protection is complete, then, when it meets two requirements: first, that it cover every portion of the property; second, that it be electrically supervised. "Supervision" by the plant's engineer, who has a hundred other duties apparently more urgent—or even by the periodic

Result of Combustible Contents

. . . a building ruined because its contents were combustible. The fire was so hot that the concrete melted and ran off the columns in rivulets

visits of an insurance inspector—such "supervision" should always be flanked with quotation marks! It is exactly the brand which prevails in those establishments where sprinklers fail at the critical moment.

These numerous references to sprinkler failures must not be misconstrued. Over a period of more than thirty years, the automatic sprinkler has functioned with perfect satisfaction in better than 98% of its emergencies. The responsibility for its occasional disappointment is invariably on the shoulders of those responsible for its maintenance.

Automatic Control Is Dependable

For this reason the sprinkler becomes thoroughly dependable only when its supervision as well as its operation is made automatic, and that can be accomplished most effectively through the medium of an outside central station. The reasons are obvious: a central station has only one concern in life and that is to keep sprinklers operative. They don't worry about the other vexations which keep your plant superintendent or engineer on the hop—they want to know that the gate valves are all open; that there is enough water in the gravity tank; that there is sufficient air in the pressure tank; that the steam pressure is adequate for the pump; that there are no leaks anywhere in the line and no frozen tanks or pipes. To determine those things at all times they connect electrical detectors to the vulnerable points in the system so that any impediment to service will report itself at headquarters and bring experienced men in immediate response.

By the same token, any flow of water in the system actuates an alarm which is relayed to fire headquarters so that trained men will be promptly available to handle that contingency. In actual experience this usually means shutting off the water, for the bulk of fires in sprinklered buildings are controlled by two heads.

However, automatic control is not confined to sprinkler systems. In many cases the sprinkler is not feasible because of the contents, the layout, the cost or other reasons, and here the automatic or detection system is indicated. Sometimes, indeed, both are used, the alarm system being installed in isolated areas or in locations which by their nature aren't reached by ordinary sprinkler delivery.

Automatic systems fall into general types: the "fixed temperature" and the "rate of rise" principles. In the former, thermostats are set to operate at a predetermined dangerous temperature—say, 150°—and when the air in a room heats the detector to that point, the thermostat closes a circuit and actuates the alarm. The "rate of rise" system is pneumatic rather than thermostatic, governed by the expansion of air in lengths of copper tubing about the diameter of an ordinary match. This action causes an increased pressure against a diaphragm, closes an electrical circuit and transmits the alarm. The distinction is that in the latter system the action occurs in the face of any *sudden rise* in temperature regardless of the starting point or of the current thermometer reading. Thus, any quick rise in temperature in a refrigeration room would cause an alarm if the room temperature were only 45°—the same sharp increase in the boiler room would sound an alarm with the temperature at 95°. In short, this principle is based on the fact that any sudden increase in a brief period spells trouble and merits attention. The "rate of rise" systems are much faster than "fixed temperature" systems—and speed is the all-important consideration when fire starts.

Heat Summons the Fire Department

Whatever the principle employed, however, it again becomes apparent that the most effective protection is afforded when the alarm system functions through an outside central station. As in the case of sprinkler supervision, this insures continuous vigilance as well as the prompt response of trained men. Too often fires become serious because those who discover them when they are small fail to do the proper thing and the blaze gets away from them. Central station supervision means that the fire department will actually be summoned by the *heat of the incipient outbreak*, not when some excited passerby or employee suddenly remembers to pull a fire box. The interval between is very often a margin between a ten dollar damage and a total loss.

While the general subject of outside supervision is up, it is worth noting that this same type of service can be applied to watchmen. By ringing in to a central office instead of merely punching a clock, the man's progress on his rounds is checked throughout each hour instead of a day later. This, of course, is an extremely significant phase of burglary protection, but beyond that it is also good fire protection because it keeps the watchman on watch or provides a relief for him within a few minutes if he is incapacitated for any reason. In one notable case a factory was burned and the watchman killed when he fell over something in the dark and lost consciousness from the blow. The lantern which flew out of his hand set fire to the place.

Fire Protection a Specialized Job

To be sure, such a thing could happen in a plant with outside supervision. But the point is that the man's failure to ring in his next station on time would result in an immediate investigation by armed guards, and the cause of the trouble would be discovered.

Be that as it may, the best fire protection is fire protection, and that specialized job had better be turned over to the specialists of a central station alarm organization. After all, fires are bound to occur for one reason or another—but they don't have to get out of control through belated discovery, tardy action or garbled alarms. One of the many fruits of this Century of Progress is automatic fire protection, and where it is applied with due consideration for its continuous operation, the menace of the serious blaze is virtually eliminated.

THE best statistical section in any rubber journal in the world is published in every issue of THE RUBBER AGE. *Consult it regularly to keep posted on the statistical position of every branch of the rubber industry.*

New Uses Are Being Developed For RUBBER and LATEX

Novel Uses Range from Dolls to Shoe Polish, with Demands from Unexpected Sources Appearing Daily

By GEORGE D. KRATZ

IN RECENT months a variety of new uses and applications have been suggested for rubber and latex, most of the inquiries coming from sources which are entirely outside the rubber industry. Many of the suggestions will consume but relatively small amounts of either raw rubber or rubber as latex. In each instance, however, the thought appears to have been that rubber could be employed to advantage either to replace another material or would add desirable qualities if employed in conjunction with other substances for a specific purpose.

The following products are either already on the market in a small way or will be in the near future:

Cosmetics—Possibly no one industry is as eager to investigate new materials as the cosmetic field. As yet, there are no cosmetics on the market with a latex base in what might be termed a commercial way. The possibilities, however, far exceed those of turtle oil, avacado oil, and other new substances which have been introduced with good results.

One organization is already testing the market in the sporting goods field with a cream containing a latex base. A slight amount applied to the hands and then rubbed in, removes the dirt and leaves the hands dry for a considerable period of time. It is said that the preparation is of particular interest to tennis players, golfers, basketball players, baseball players, and any one troubled by excessive perspiration. Any tendency of the bat or racquet to slip is said to be eliminated for a considerable period of time after application of a small amount of this cream to the hands.

Another application somewhat similar to the above, is the use of latex in cleansing creams. In this instance, the latex functions as a cleansing agent in that it induces a tendency to ball up, roll off, and carry away the dirt as well as the other ingredients of the mixture. Latex also has been suggested as an ingredient in finger wave preparations to set the hair in a permanent position for a period of time. To date, although the interest along these lines is in no way diminished, the results obtained are not sufficiently efficacious to meet with approval.

Food Containers—One of the widest fields for latex is found in the coating of containers used for packaging food stuffs. Cereals, cookies, and exceptionally greasy products such as doughnuts, are now widely distributed, packaged in paper containers. It may be possible to introduce peanut oil, olive oil, and other products of a similar character to the market in paper containers when research now being carried on, perfects the proper protective coating. Latex coatings for this type of product are already on the market.

In some instances, the use has been found advantageous; but unfortunately, the efforts have chiefly been directed in attempts to solve the most difficult problems first. In most cases, the greatest interest has been shown in the development of grease-resisting coatings. Latex has a decided field in this type of application but it is one which must be developed by successive steps. The de-odorizing, not the re-odorizing of the rubber is of prime importance in this connection, if the package is to arouse commercial interest.

Shoe Polish—White shoes are notorious for their ability to become dirty on short notice and require dressing with a preparation which in most instances sheds a white powder or dust to any darker material with which it may come in contact. Latex is now being incorporated into such mixtures to prevent this undesirable feature and to insure a greater permanency in the coating applied.

Typewriter Cleaners—The type of a typewriter, particularly such letters as "G," "O," and "Q," etc. quickly become clogged with lint and dirt from the ribbon. It is extremely difficult to clean the small cavities without resorting to the use of a brush and cleaning fluid, the manipulation of which is not only a tedious operation but also is regarded by the stenographer as extremely annoying. Recently, an adhesive gum has been introduced which, by simply pressing it against the keys, removes the dirt quickly and with little effort or bother. The gum is sufficiently plastic that the dirt may be worked into it and a fresh surface presented for cleansing purposes. The base of the gum is latex. A somewhat similar adhesive gum is being introduced to pick up small or delicate pins, screws, or any article which is difficult to locate and still more difficult to handle easily. This type of gum is being introduced to watchmakers and similar lines.

Transparent Hard Rubber for Dental Plates

Transparent Dental Plates—Recently a number of plastics and resinous substances have been introduced to replace the hard rubber long used to form the basis of the plate and bridgework used by dentists. Claims were made for transparency, ease in molding, quick repairs to broken elements, etc. The claim for transparency was apparently well warranted in the case of plastics but the advantages as to ease in molding and quick repairs is evidently as yet to be established. At any rate, a number of dentists are more interested in obtaining a transparent hard rubber than they are in experimenting with new materials. Such compounds are now being used in an experimental way.

Auto Striping—The painting of auto bodies in most cases involves the application of fine lines of various colors

for decorative purposes. This is usually accomplished by pasting a thin strip of gummed paper to the body, using a spray gun to apply the paint and then removing the strip of paper for coverage of the stripe beneath with another color. Latex has already found wide application as an adhesive of this type. Further developments are desired whereby the paper strips may be used throughout a series of operations.

Adhesive Bandages—For some time, thin strips of latex crepe, usually protected on one side by metal foil, have been on the market, as adhesive wrappings or binding materials, in bandaging operations. More recently, elastic webbing, treated with latex solutions, has been developed for the same purpose and permits of the same adhesive or binding qualities with better breathing or air penetration.

Religious Plaques—The molding of plaques and other objects of art usually involves the preparation of a clay or plaster model, a coating of gelatine or similar protective material and subsequent recasting. Owing to the rigidity of the molding material, casts made in this manner are inflexible and of short life. A recent patent includes an admixture of latex with the plaster and the formation of what is claimed to be a flexible mold which permits of continued re-use.

Laundry Bags—Most laundries sort their customers' property, encase each lot in a cotton bag and subject the whole to rigorous processing. The bags used for this purpose are made from a rather heavy netting of special construction. When impregnated with latex solutions, such bags have been found to have an increased life of about 25% at an increased cost of 10%.

Dolls—It has been found practicable to substitute latex for rubber in the manufacture of dolls. Another doll shortly to appear on the market consists of a fibre form of considerable strength which has been dipped in a latex solution and coated. Extreme lightness is claimed for dolls of this character.

The above applications for rubber and latex constitute but few of some of the newer developments which are going on outside the rubber industry. All of them are now either on a commercial or semi-commercial basis.

A number of other ideas along the same lines are already under investigation but have not as yet been placed on the market. Some of these appear to have interesting possibilities and include the use of latex as a machinery lubricant, as a cushion for setting plate glass windows, for application as a beauty mask (cosmetics), as a substitute for oil in flotation recovery processes for metals and other uses of equally wide diversification. Many of them will no doubt prove of little practical value, but those which are ultimately found to be useful will carry rubber into fields hitherto not anticipated.

Dunlopillo Cushioning

STEADY progress in the development of Dunlopillo cushioning is being made by the Dunlop Rubber Company, Ltd., and a wide range of products of this construction are being produced at its plants at Fort Dunlop and Manchester, England. It is already being widely used for mattresses, lounge furniture, loose cushions, motor car seating and seats for buses, railway coaches, taxicabs, ambulances, motion picture theatres and churches. Full page newspaper advertising is introducing it to the general public.

In its production, purified latex is frothed or aerated by means of large whisks that produce countless tiny interconnected air cells which provide complete porosity throughout the material. The outside atmosphere, therefore, has full access throughout each unit; so that Dunlopillo cushioning is always cool and properly aired, an advantage not possessed by other forms of upholstery material. The latex froth is molded to the shape of the desired product and vulcanized.

Over 2,000 Dunlopillo mattresses have been sold to hospitals in the course of a few months, and a number of British furniture manufacturers are now using Dunlopillo cushioning for easy chairs, settees and other lounge furniture. Three English automobile manufacturers are using this material as standard equipment, while numerous car owners have had Dunlopillo cushioning installed when having their seating renovated. More than 2,000 buses and coaches are fitted throughout with this new type of upholstery, and the London Passenger Transport Board, which already has 500 buses so equipped, has definitely standardized on this cushioning.

Dunlopillo mattresses were used in the Royal Scot train which visited Chicago for the Century of Progress, and other British railroads are also employing these mattresses in their sleeping cars.

Hot Water Bottles in Italy

WHEREAS at one time a number of United States firms sold considerable quantities of rubber hot-water bottles, syringes and combination hot-water bottles in Italy, the market is now entirely supplied by a local firm and several German rubber companies, the bulk of the sales being controlled by the Italian concern, according to A. B. Muddiman, Canadian Trade Commissioner.

A cheap quality of hot water bottle is being offered at a price to suit the purchasing power of the average consumer. The sizes in greatest demand are those with capacities of one and a half and two litres. Wholesale prices are 6.70 lire (56 cents) for the small size and 7.75 lire (62 cents) for the larger, but the products of one German manufacturer are offered at approximately 60 centesimi (5 cents) less than the prices quoted for the Italian article. The market for Canadian bottles is limited to that provided by consumers desiring a more expensive, better finished article, particularly in regard to screw-closure.

In order to reduce duty charges, each water bottle should be packed in a transparent envelope instead of in a carton, as the latter can be procured by the agent. Unless other instructions have been received, shipments should be made in bulk, the goods being forwarded by parcel post via England in order to save time. Advertising should consist of a single sheet illustrating the principal designs, with text and prices in the Italian language and currency respectively, and can probably be prepared to best advantage in Italy by the agent. The colours preferred for the water bottles are red and brown.

Rubber hot-water bottles are dutiable at 660 lire ($55) per 100 kilos, plus 15 per cent ad valorem.

Czechoslovakia Attempts to Grow Rubber

INCREASING demand for rubber products in Czechoslovakia has resulted in an attempt to cultivate rubber plants that will resist local climatic conditions so that the country may be less dependent upon imports. At the State's Agricultural Station at Pruhonice, cultivation tests have been in progress for several years with plants, such as *Asclepias syriaca, Rhus cotinus, Eucommia ulmoides, Maclura aurantica* and others.

The plants are tested and analyzed at various stages of development and the influence of the fertility of soils and of various fertilizers upon the quality and amount of latex is studied. *Asclepias syriaca* is receiving especial attention since it is believed not to require any particular quality of soil. Chemists are seeking a reliable method of extraction and treatment of the contained rubber substance.

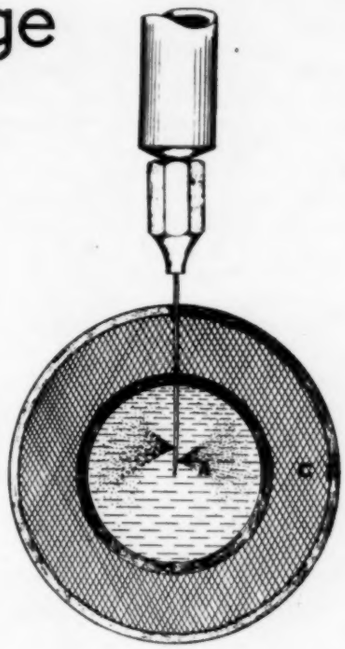
After-Injection Gives Added Pressure To Increase Golf Ball Yardage

New Process Adds Extra Liquid to Inner Core of Ball, Assuring Internal Pressure Sufficient for Distance

GOLF ball production has always aimed at the development of two primary qualities. First, for the greater number of players of the game, a ball should have durability and resistance against possible cuts. This means the use of a tough cover. Second, for those players who demand the utmost in performance, a ball must be able to travel as great a distance as possible. This means high internal pressure.

Unfortunately, the development of these two characteristics has not always been compatible. The high temperature vulcanization necessary to produce the tough cover results in loss of tension on the rubber winding and a consequent reduction in internal pressure. A solution to this problem has now been worked out in the laboratories of A. G. Spalding & Brothers, Chicopee, Mass., through the injection of additional liquid into the finished ball, and balls produced by this company's new process are said to combine durability with long flight.

Most of the secret of a long flight golf ball lies in internal pressures. For instance, the longest ball in the game has a pressure, at the core, of 1,500 to 1,600 pounds per square inch. However, this long distance ball has always had one disadvantage for the golfer who sometimes tops with his woods, or fails to get under with his iron—the soft cover cuts, and a good ball is spoiled. For this golfer, who constitutes the majority of devotees of the game, a tough cover ball was developed, which is practically impervious to cuts. Its popularity was instant, and has continued to increase.



Golf Ball "Needle"

Liquid added to the content of core (A) causes sufficient expansion to give added tension to threads (C), with a slight expansion of cover (D), all of which contribute to greater yardage

But the tough cover ball had one disadvantage. Some distance was sacrificed to durability. Golfers who wanted a ball that would not cut made this sacrifice quite willingly, but the manufacturers were not satisfied. They wanted both durability and distance. The problem was put up to the laboratory to solve. The solution was simple in conception, but difficult from a production standpoint. A "hypodermic" injection of 6/100 of an ounce of liquid into the core of the tough cover ball increased internal pressure and increased distance as much as 7 to 10 yards on the average long drive.

One of the main essentials of a long distance golf ball is high pressure at the core, which provides the necessary high elasticity under impact of the club head. This pressure, exerted on the liquid sac which constitutes the core, is built up by the winding over the core of a continuous thread of rubber under tension.

The cover is then applied over the winding by a molding process which seals the two halves. In the case of the long distance, softer cover balls, the molding temperatures are not high enough to cause loss of tension on the winding, and in consequence an internal pressure of 1,500 to 1,600 pounds per square inch is retained in the finished ball.

When the tough cover of the cut resisting ball is applied, however, much higher temperatures are required. This cover being vulcanized, a longer time in the press is necessary. The result is a loss of a part of the ten-

Machine for Added Injections

By this apparatus the operator can make the "hypodermic" insertion of additional liquid to raise the internal pressure of the golf ball

sion on the rubber winding, the effect of heat on stretched rubber, and a consequent loss of a part of the internal pressure. The result is a ball which, while having a cover that is practically proof against cuts, at the same time has a distance from 7 to 10 yards less than its softer covered brother.

Here was the problem for the laboratory—how to restore the lost pressure and still retain the tough cover. Obviously it was a job that had to be done after the ball had been completed, since the loss of pressure was an inescapable result of the vulcanizing process.

A hollow steel needle, similar to a fine hypodermic needle, is thrust through the cover, through the rubber thread windings, and into the liquid center. The added quantity of liquid—exactly six one-hundredths of an ounce—is forced in under high pressure. Immediately an initial pressure of 800 pounds is raised to about 1,400 pounds, being what the ball really needs to get maximum distance.

The balls to be treated are manufactured with a diameter of 1.67 inches, the "shot" causing an expansion which raises the diameter to 1.68, the United States Golf Association size. Weight added by the injection also is compensated for, the initial weight before treatment being 1.56 ounces. The "shot" raises the weight to 1.62, the standard.

Thus, one goal of the golf ball manufacturer has been reached with a development that provides the maximum distance considered desirable in the game, without sacrifice of durability.

Rubber-Tired Wheels for Farm Wagons

WITH the use of rubber tires on tractors, the tractor can now be used for transportation purposes on the highways to a degree which was never deemed possible with steel wheel equipment. Indications point to the fact that it will be possible to travel at least 25 miles per hour on paved highways, consequently, wagons or trailers for tractor use must be equipped with rubber tires to meet the higher speeds in transportation work.

Various types of wheels, including rubber-tired wood, and steel wheels, equipped with various types of bearings were tested by E. A. Silver, of the Department of Agricultural Engineering of the Ohio Experiment Station, over five tractive surfaces—meadow, cultivated soil, and cinder, gravel, and concrete roads. The greatest draft was required on cultivated soil, followed in order by meadows and gravel, cinder, and concrete roads. Much depends, however, upon the condition of the cinder and gravel roads.

The low-pressure tire with an inflation of approximately 25 pounds required the least draft on all tractive surfaces, with the exception of concrete roads. On the gravel road, which is more or less common on the farm, the solid rubber tire required 120.2 pounds to move a 5,000-pound load at 2½ miles per hour; the high-pressure pneumatic tire required 107.8 pounds; whereas the low-pressure pneumatic tire required 57.7 pounds, and the steel wheel, 191 pounds. The greatest difference in draft between the low-pressure tire and the steel wheel (amounting to over 200 per cent) existed on this tractive surface. The reason for this great difference is that the steel wheel must climb over stones or other irregularities on the road surface; whereas the low-pressure tire will move over the same obstructions easily and gently with no noticeable rise to the load itself.

The importance of wheel diameter depends largely upon the tractive surface on which the load is transported. In cultivated soil the smaller diameter wheels required more draft, ranging upon the weight of the load transported and the speed traveled. Very little difference in draft was noted on meadow between large and small diameter wheels.

Friction of Tires on Road Surfaces

PROFESSORS K. W. Stinson and C. P. Roberts of the Department of Mechanical Engineering, Ohio State University, are continuing their investigation of the friction of tires on road surfaces. In a preliminary report on this study of skidding, the investigators presented the following findings:

"From the standpoint of safety there are two trends shown by the results of these tests that are worthy of consideration. (1) The coefficients of friction on all road surfaces decrease with increase of speed. (2) The difference between the rolling and sliding coefficients increases with increase of speed. Considering these points, the driving hazards on wet-road surfaces are much more serious as the speed is increased, not only because of the decrease in the rolling as well as sliding coefficients of friction, but also on account of the increasing difference between the values of rolling and sliding coefficients of friction. This latter variation is exceedingly serious when brakes are applied suddenly, as any type of brake may operate unequally at times on the four wheels, and when one wheel slides there is a radical decrease in braking force on this wheel, which may easily cause the driver to lose control of the car."

Robert G. Kilgore, Robinson fellow of the University, has been assigned to this study. Cooperation in continuing the work has been obtained from the Firestone Tire and Rubber Company.

Turkelene

AS A substitute for sulfonated or Turkey red oils, which are used in many industries, the Glyco Products Company, Inc., Bush Terminal, Brooklyn, N. Y., is offering a new synthetic oil called "Turkelene." The latter is a better emulsifier and will "carry" larger percentages of oils. It forms stable emulsions of oils and water by merely shaking or stirring—no heating or elaborate equipment is necessary.

"Turkelene" is neutral and since it contains no sulfur or combined mineral acid, it will not split off acid on heating or aging. It is non-drying and acts as a softener, penetrant and lubricant. It is less viscous and lighter in weight than sulfonated oils. It gives a milky dispersion in water but will "take" 2-3 volumes of mineral (forming a "soluble oil") without turning milky.

It may be used for textile emulsions, dyeing assistants, detergents, paper treatments, polishes, soluble oils, soapless shampoos, fat liquors, lubricants, softeners, sprays, and for many other purposes for which sulfonated oils are now used.

Press Equipment for Molded Goods

IMPORTANT in the selection of hydraulic press equipment for the production of highest quality molded rubber goods is ram diameter. In general, much better rubber goods are produced as the pressure applied to them increases. If the size of the ram is large enough practically to equal that of the molds used in the press, the pressure is greater and more evenly transmitted to the mold. This tends to reduce defective goods. To illustrate, suppose two 24 by 24 in. presses are equipped respectively with 10 in. and 20 in. rams, and the molds cured in these presses are 20 in. square, and that the hydraulic pressure available is 1,000 lbs. The 10 in. ram will transmit to the 20 by 20 in. mold approximately 200 lbs. per square inch of mold surface, while the 20 in. ram will transmit to the 20 by 20 in. mold approximately 800 lbs. per square inch of mold surface.—*R. R. Olin Laboratories, Akron, O.*

Belt Developments and Belt Research

By C. A. NORMAN

Professor of Machine Design, Ohio State University

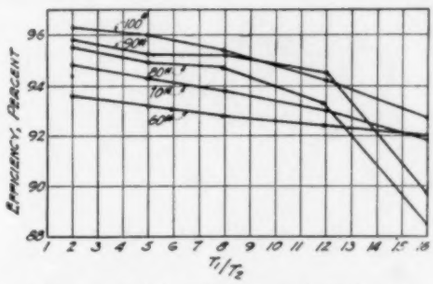
A BELT is held to be a very modest and simple machine element, so much so that some people might feel it would hardly pay to waste research on it. Yet, there are good belts and bad belts, and the belt-using public is entitled to know what constitutes a good belt and what constitutes a bad belt. Moreover, belt manufacturing is an important industry in the state of Ohio, some of the largest rubber belt factories of the world being located here, and there are certain points about belts which have sales importance, even if their significance to the user is not so great. Thus, all belts slip and creep to some extent, and it is not possible by means of belts to maintain an exact transmission ratio. The slip amounts to only one or two per cent, and in general, where an exact transmission ratio is not required, it makes little difference to the user whether the slip is one per cent or two per cent. However, some manufacturers make a great sales argument out of the claim that their belts slip less than any others, or, in fact, that they do not slip at all. The belt buyer should be informed what weight he should give to such arguments in selecting a belt, and whether they are based on fact or on misrepresentation.

The two really important matters about a belt are its *transmissive power* and its *stretch*. The transmissive power depends upon two factors, the strength of the belt and its adhesion to the pulley. It is of little use to make a belt so strong that it will slip off the pulley if the attempt is made to have it transmit all the pull of which its strength would make it capable. A belt which has a great strength in proportion to its adhering capacity must be put on very tight if it is to pull at all.

Effect of Tight Belts

Tight belts, however, mean great bending forces on shafts, great bearing loads, high bearing frictions, and shortened belt life. The importance of this latter fact is brought home clearly when it is realized that the belt life goes down inversely with the fourth or fifth power of diameter. That this is true for flat belts has been established by the Goodyear Tire and Rubber Company; that it is true for V-belts has been made clear by tests by the writer, published in 1932 by *American Machinist* and *Product Engineering*. That this relation to the life of the belt and the inconvenience of belt stretch and take-ups may justify one in putting in belts twice as heavy as those ordinarily used in commercial practice was the rather startling revelation brought out through many years of cost keeping by no less a man than F. W. Taylor, the father of scientific management.

The first belt research of importance undertaken at the Ohio State University very properly dealt with the question of the *Transmissive Power and Stretch of Belting*. It was published by the Engineering Experiment Station in 1928 as Bulletin No. 41. It was found that certain leather belts possessed a very high surface adhesion when compared with certain rubber belts. Since the latter are an important Ohio product, the next step was to find out whether it would be possible in some way to improve their surface adhesion. Tests, published as Engineering Experiment Station Bulletin No. 62, brought out the fact that paper pulleys, at least when not glazed over, showed a materially higher transmissive power, particularly with rubber belts, than did cast-iron pulleys.



Variation of Belt Efficiency with Tightness

In the meantime rubberized V-belts had come to be extensively used and the question came up whether the V-belt did not fully equal or even surpass the best leather belt in adhering power. The writer investigated this matter for one of the ranking V-belt manufacturers in Ohio and arrived at the conclusion that the V-belt might not equal one of the highest grade of mineral tanned belts, *when the latter was new*. However, in the course of a few years the surface condition of the leather belt might change to one giving materially lessened adhesion, while the wedge action of the V-belt, being purely mechanical, did not change at all. In consequence the latter was found superior after some years of running. These findings could not be published without permission by a well-known German belt expert to whom they had been submitted by the V-belt manufacturer. Thus they are accessible in a German periodical.

Recently much attention has been devoted to high-speed driving, such as that required for grinders, various woodworking and paper machinery, etc. High-speed driving requires two characteristics in the belt. In the first place, it should be light so that it will not be greatly affected by centrifugal force. If it is, it is necessary to put it on very tight, and this has the unfavorable effect on stretch and belt life above referred to. In the second place, it should be flexible so as to hug effectively pulleys of small diameter at the high-speed end.

It has long been known that the efficiency of belting is dependant on the load transmitted. The belt loss proper consists partly of slip or creep and partly of flexing work on the pulleys. The latter is constant no matter what power the belt transmits. Hence it is a greater percentage of a low transmitted load than of a high load, and the efficiency goes down as the load decreases. That idling and low-load losses may be a serious burden in belt-driven machinery has been known for a long time. Many years ago Professor Benjamin discovered a case where the idling losses of belt-driven shafting amounted to 77 per cent of the available power. A qualitative idea of how efficiency may vary with load is shown by the curves in the figure, from a series of research not yet published.

The efficiency shown is plotted against tension ratio. Tension ratio is a measure of tightness; the higher it is, the slacker is the belt. A tension ratio of 2 indicates that the belt is very tight. Tension ratios of 10 and more mean that the slack side tension is only 10 per cent or less of

the tight side tension; in other words, that the belt is extremely slack.

Both for high-speed drivers and for low-load conditions it is of importance to study the flexing work of modern belts. This is one series of research on which the Engineering Experiment Station has embarked and hopes to be able to carry through as soon as financial resources permit. It is suggested that persons interested in such matters communicate with the writer of this article or with the Engineering Experiment Station, since by the joint support of a few belt-makers and belt-users, the burden of carrying out this work would not be heavy.

Tornesit—A Base for Protective Coatings

(Continued from Page 18)

Beyond noting the possibilities of Tornesit in thermoplastics and in various protective coating fields, we have confined our tests chiefly to rough finishes for steel and concrete where protection against perishing in general and chemical action in particular is of first importance. In this field, Tornesit has given a rather extraordinary performance, not only in the laboratory, but in actual service on our plants and on some of our tank cars. Some of these service trials can be referred to here.

At our plant at Gillespie, N. J., we have what constitutes the severest conditions for a paint job to be found anywhere in our operations. On the dipping floor of the nitrating house the acid fumes have made it necessary to frequently repaint the steel work there. Numerous commercial paints recommended for the job have given protection for a period ranging from a few weeks to four to six months. Pigmented Tornesit paints are still giving excellent protection after one year's service.

At the same plant, there is a concrete pit to permit recovery of short fibre Nitrocellulose which otherwise would be lost in the hot weak acid wash water. Here the problem to us is a dual one; avoiding the disintegration of the pit, and of greater importance, avoiding the contamination this causes our product. Here commercial paints have been tested with rapid failures. A year ago a section above and below the water level was given two coats of Tornesit paint and although the film has turned white, it is still affording perfect protection.

The explosives plants have another problem in coating the nitroglycerine pre-wash tanks and painting the interiors of the nitrator buildings. It has been the custom to bring men in on Sundays and other holidays to repaint these tanks monthly. Tornesit paint was applied last October and is in perfect condition today. Due again to acid conditions in the nitrator buildings paints used to protect the steel work there have become soft and sticky after brief service. Tornesit paint remains hard and satisfactory in all respects.

Used for Coating Tank Cars

Tank cars carrying turpentine, mixed acid and 50% ammonium nitrate solutions have been coated with Tornesit paint with entire satisfaction. The exterior of the tank car in the acid service after fifteen months is in perfect condition except around the dome where numerous bad acid spills have left their marks. As you probably know from your own experience, 50% ammonium nitrate solution is very destructive to paint coatings. The interior of this tank car was painted with Tornesit and after ten months' service, has had only minor repairs. The exterior of the turpentine car was painted only about six months ago and, of course, it is too early to expect any failure there.

Some concrete floors have also been painted with Tornesit. More than a year has passed since this was done and wear is just beginning to show where the traffic has been the greatest.

These field tests are mentioned to show the value of Tornesit for chemical plants. From these tests it is apparent that Tornesit, when properly compounded, can be made to adhere perfectly and to resist to a remarkable degree very severe conditions which today constitute some unsolved problems in the protective coating industry.

Tornesit formulas can be sprayed or brushed. For spraying, the formula must be thinned to a Tornesit content of 12-14%. This is approximately 40 cps., and is lower than the spraying viscosity of lacquer, which is sprayable at 75 cps., but the difference is not as great as appears at first sight. This additional thinning is done to avoid spider-webbing or stringing out that results where heavier viscosities are sprayed. This still enables one to have a spray paint containing from 30 to 40% solids. For brush application, the Tornesit content ranges from 20-22% and the total solids up to as high as 57%. High boiling solvents should be used to avoid lap marks and the paint applied with some degree of care as it cannot be worked very much with a brush without incipient drying and dragging. Excessive working with a brush is especially to be avoided when applying over an undercoat.

When considering a new product, some very important points are availability and present and prospective coat. Regarding availability, adequate stocks are maintained in this country. With respect to cost, Tornesit's present market price is 50c a pound. This price reflects the unfavorable rates of current exchange and includes duty. Tornesit is affected only to a minor degree by rubber fluctuations as compared to many other rubber consuming products. When production begins here, a much lower price is assured. With the prospect of early production of chlorinated rubber in this country, I think it urgent that the protective coating industry in general and the paint and varnish manufacturers in particular should not delay in acquainting themselves with the very useful and versatile properties of this interesting new raw material.

Code Signed for Carbon Black Industry

A CODE of fair competition for the carbon black industry is now in effect, having been signed a few weeks ago by General Johnson. The code vests with the governing authority power to decide upon increases in plant capacity of the industry in any given region at any time such action is considered advisable, subject to the approval of the administrator. The industry is stated to be composed of about two dozen concerns having a $40,000,000 investment and employing about 1,300 men.

New Russian Process in Making Goloshes

THE Leningrad factory Krasny Bogatyr (Red Hero) has started making goloshes by a new system.

The sole and top are placed in a special metal mould, which is put under a hydraulic press, and the two parts are firmly joined together at a temperature of over 140 degrees Celsius, so that a golosh is produced without seams. The whole process of assembling and vulcanizing the golosh can be completed in a fraction of the time taken under the old method, by which the different parts were stuck together.

Another advantage is that the goloshes can be made entirely of synthetic rubber instead of only to the extent of 30 per cent. As Russians are paying great attention to the manufacture of artificial rubber this is of importance. The new type of golosh is said to be superior in quality to the old and much more durable.

New Equipment

Meyers-Mesco Viscosity Regulator

REGULATION of the viscosity of liquids and semi-liquids used in manufacturing processes is provided by the Meyers-Mesco Viscosity Regulator, developed by the Merritt Engineering & Sales Company, Lockport, N. Y. The particular unit illustrated is designed to regulate automatically and continuously the viscosity of electrical wire insulating varnish at an eastern electrical manufacturing plant. The varnish is constantly circulating and tends to

become heavier, owing to the natural evaporation of highly volatile solvents.

Use of this machine in the rubber industry is recommended where volatile liquid coatings are to be applied to insulated wire or to brightly finished shoes or novelties. It may also be employed for the adjustment of the density of latex dispersions and solvent cements for dipping.

A slowly revolving agitator suspended in the liquid to be regulated provides the regulating impulse for the machine. Any increase or decrease in viscosity, as reflected by varying agitator rotative resistance, is transmitted by sensitive mechanical means to a needle valve which admits just enough thinning solvent to maintain constant viscosity within very close limits.

Foxboro Control Instruments

TWO new control instruments have been developed by the Foxboro Company, Foxboro, Mass. Their appearance is practically identical, but one controls temperature, the other pressure. The dial and knob on the lower face of the controller permits adjustment of the temperature or pressure within the range of the instrument. The indicating gauge above the adjusting knob shows the air pressure on the diaphragm motor of the control valve and also shows whether the valve is opening or closing.

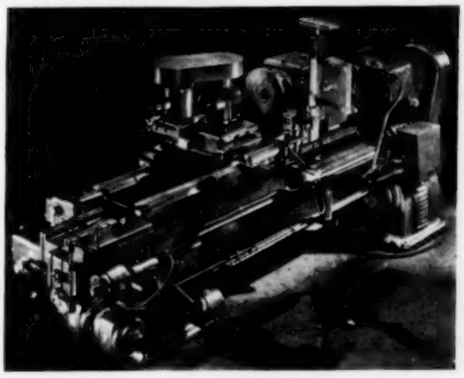
On the temperature controller, a two-inch dial type thermometer may be installed in place of the air gauge. This thermometer is connected to the same bulb as the controller, thus showing the temperature being maintained. The pressure controller may be equipped likewise with a high pressure indicating gauge that shows the pressure be-

ing controlled. In either case, it is necessary to mount a valve motor air gauge on the air line to the valve outside the case.

These new controllers have a universal case so designed that it may be either flush or surface mounted. The one case serves for either style without change. The connection may be either top, bottom or back.

Monarch Cam Milling Attachment

DESIGNED for use in connection with the Monarch-Keller lathe, a new cam milling attachment has been developed by the Monarch Machine Tool Company, Sidney, O. It consists of a sub-headstock that bolts on the bed of the lathe directly in front of the regular headstock. It is driven by a silent chain from a sprocket bolted to the flanged spindle nose of the regular headstock, and a com-



plete universal milling fixture fits readily on the carriage of the lathe, in place of the regular compound rest.

The device is especially adapted to milling face cams, single or double track cams, barrel cams and other irregular contour work from a master template. The milling headstock has a worm drive spindle giving a 450-to-1 reduction from the spindle speeds provided in the main headstock of the lathe.

Phase Changes in Rubber

THE change in volume of rubber with temperature, states a report by the Bureau of Standards, has been investigated from —85 to +85 C. in connection with a study of the heat capacity and related thermodynamic properties of rubber. The immediate purpose was to determine the phases in which rubber may exist, the temperatures at which transitions from one phase to another occur, and the periods of time required for transition to take place under various circumstances.

Measurements of volume change were made by enclosing samples of rubber with suitable confining liquids in dilatometers of pyrex glass and observing the changes in height of the liquid in the calibrated capillary tubes of the dilatometers. Water, alcohol, acetone, and mercury were used as confining liquids in temperature ranges for which they were respectively suitable.

The samples employed included crude rubber, purified rubber in both the sol and the gel modifications, and vulcanized compounds containing 2, 4, and 6 per cent of combined sulphur, respectively.

The principal phase change observed was the one attendant on the well-known phenomenon of the "freezing" of raw rubber, previously studied by Bunschoten, Van Rossem, and other investigators. The same phase change is probably involved in the melting of rubber crystals as reported in the Bureau of Standards Journal of Research for April, 1933. The transition from the ordinary form of rubber to the more dense or "frozen" form was found to occur at about 5 to 15 C. with a decrease in volume of approximately 2.7 per cent. The transition was practically the same with the purified rubber as with the crude rubber, but no indication of any comparable change was observed in the case of the vulcanized samples.

The rate of change from the ordinary to the more dense form was found to depend on the temperature. At 0 C. about 10 days were required for the practical completion of the volume change; at somewhat lower temperatures, less time was required, but at still lower temperatures, the rate became very slow. No measurable indication of transition was observed, for example, when a sample was held below —40 C. for 3 weeks.

When samples which had been cooled rapidly to below —40 C. were warmed slowly the transition occurred with a decrease in volume which so overshadowed the effect of thermal expansion, as to give the appearance of a negative coefficient of thermal expansion. Heat capacity measurements made under similar circumstances indicated that heat was evolved as the sample was warmed. This was to be expected since the transition is accompanied by a relatively large latent heat effect.

The transition from the more dense form back to the ordinary form was not observed to take place below the range 5 to 15 C. At temperatures below this the more dense form is apparently stable.

A second type of transition, characterized by a marked change in coefficient of thermal expansion, was observed at considerably lower temperatures in the case of all samples of rubber, both vulcanized and unvulcanized.

When unvulcanized rubber was cooled without delay from room temperature to —70 C. the coefficient of expansion decreased from approximately 0.00070 to approximately 0.00065 vol/vol/° C. Between —70 and —76 C., however, a change occurred lowering the coefficient to approximately 0.00025 vol/vol/° C. Rubber in the more dense form exhibited similar behavior. The coefficient was about 0.00065 vol/vol/° C. at 0 C. and decreased to about 0.00060 vol/vol/° C. in the neighborhood of —70 C., below which it dropped to approximately 0.00025. The temperatures at which the changes in coefficient of expansion occur for the two forms of rubber have not yet been determined with sufficient precision to say whether they are the same or differ slightly.

Measurements of the heat capacity of pure, unvulcanized rubber which are in progress show an anomaly in the range of —70 to —76 C. This probably corresponds to the change in the conefficient of thermal expansion.

Measurements of electrical properties which were made at temperature intervals of about 5 C. in connection with another investigation, gave no indication of anomaly, but when the measurements were repeated with precision at intervals of one degree, a small but definite change in dielectric constant was observed at —73 to —74 C.

It would seem reasonable also to associate this phase change with the hardening and brittleness which is observed when rubber is cooled quickly to low temperatures. However, investigators who have studied the latter phenomenon find that it occurs in the case of unvulcanized rubber at about —55 C,. which is not in accord with the present findings.

The vulcanized rubber samples showed changes in the coefficient of expansion similar to those for unvulcanized rubber at somewhat higher temperatures. The compound containing 2 per cent of sulphur showed the change at about —72 C.; for 4 per cent of sulphur, the change occurred at about —62 C., and for 6 per cent, at about —53 C.

Osborn Tramrail Sliding Switch

ENTIRELY new in design, a tramrail sliding switch is announced by the Osborn Manufacturing Company, Cleveland, O. This design is said to be revolutionary by endeavoring to take into consideration that an installed tramrail switch involves the switch itself, the supporting superstructure, the fittings, the curved and straight rail entering the switch, and the combined erection time of these elements.

The curved section and the straight section of Teerail are welded to the sliding plate which moves to either position of the switch on four rollers mounted on the switch frame. A latch at either end on the upper side of the sliding plate keeps the switch locked in position. To throw the switch, the chain attached to the locked latch is pulled to release the latch and to toll the switch into the other position. The other latch locks the switch.

Acrin—a New Accelerator

TO MEET the need for a superior accelerator for pneumatic tire stocks, the Rubber Chemicals Division of E. I. du Pont de Nemours & Company, Wilmington, Del., has developed a new material of this type under the name of Acrin. It has been the company's intent to find an accelerator that would produce stocks that neither tend to soften nor become short and brittle when subjected to high temperatures and severe flexing in service.

Acrin is made by first reacting hexamethylenetetramine with benzyl chloride and then reacting the product with the sodium salt of mercaptobenzothiazole. During these reactions the components that are used lose their individual characteristics completely, forming a definite chemical compound that is stable and non-toxic.

Acrin is offered in the form of small light brown pellets that flux readily into rubber during milling. It may be added directly to the batch, although the company recommends using all accelerators in the form of masterbatches. Acrin is said to produce high modulus stocks that have an exceptionally broad range of cure and excellent aging and heat resisting properties. It is a self-activated accelerator which does not require the use of a secondary accelerator to develop its maximum strength and activity.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry.

RUBBER AND AUTOMOBILES. By Colin Macbeth, with foreword by F. W. Lanchester. Published by the Rubber Growers' Association, Inc., 2 Idol Lane, Eastcheap, London, E. C. 4, England. 132 pp. February, 1934. Free on application (postage 4½d.).

This is the second edition of a volume which first appeared in May, 1933. Additional information is now provided on rubber suspension systems, sliding spring shackles, rubber bumpers which act as stabilizers, engine and radiator mountings, crankshaft bushings, steering wheel horn rings, door hinges, rubber seatings and latest types of leak-proof moldings for coach bodies. A more comprehensive index is included, and illustrations of the new items mentioned are presented, together with a frontispiece depicting rubber usage on the modern car. The book is bound in a loose-leaf cover to permit the inclusion of additional material.

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RUBBER: REPORT A-9. Published by the National Association of Purchasing Agents, 11 Park Place, New York City. 28 pp. March, 1934.

The intent of this report is to present a fairly complete survey of conditions existing in the rubber industry for the benefit of the purchasing agent who is assigned the duty of buying this commodity. After a general discussion of the growing and manufacture of rubber, details of packing, prices, specifications, statistics and sources of information are provided. Particularly helpful are personal purchase practice opinions and suggestions by ten representative buyers of crude rubber.

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ACRIN TIRE STOCKS. Laboratory Report No. 171. Published by E. I. du Pont de Nemours & Company, Wilmington, Del. 8 pp. February, 1934. For free distribution.

TIRE REPAIR STOCKS ACCELERATED WITH ACRIN. Laboratory Report No. 169. Published by E. I. du Pont de Nemours & Company, Wilmington, Del. 6 pp. February, 1934. For free distribution.

Acrin is a new accelerator developed to produce pneumatic tire stocks that neither tend to soften nor become short and brittle when subjected to high temperatures and severe flexing in service. It is made by first reacting hexamethylenetetramine with benzyl chloride and then reacting the product with the sodium salt of mercaptobenzothiazole. During these reactions the components that are used lose their individual characteristics completely, forming a definite chemical compound that is stable and non-toxic. Recommendations for its use in tire stocks and tire repair stocks are contained in these laboratory reports.

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SPECIFICATIONS AND DATA FOR TRUCK AND BUS SERVICE BATTERIES. Published by the B. F. Goodrich Rubber Company, Akron, O. 8 pp. 1934. For free distribution.

Specifications and replacement data on batteries for all models of buses, trucks, fire trucks, taxis and tractors, as well as complete drawings showing assembly plans for each type of service are presented. The new Goodrich line of truck and bus service batteries, introduced only a short time ago, are described, together with details of the company's guarantee and adjustment policies.

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THE JOB AHEAD FOR MACHINERY. By Allen W. Rucker and N. W. Pickering. Published by the Farrel-Birmingham Company, 11 Main Street, Ansonia, Conn. 16 pp. 1934. For free distribution.

Reform economists who assert that machine improvements must be prohibited or limited for a period of years have no real grasp of the situation, according to the authors of this sixth of a series of "booklet-editorials." On the contrary, it appears to the writers that there is a strong probability that we shall not be able to absorb the unemployed and maintain both the rate of social progress and the improvement in economic well-being during coming years without greatly augmenting the use of efficient machinery. Similarly, they feel that with business normally employing 97 per cent of all men between the ages of 25 and 45, and 94 per cent of those between 46 and 65, this is no time to impose artificial restraint upon the hours of labor by such a step as a sweeping 30-hour week law.

DO YOU KNOW ABOUT? Published by the Glyco Products Company, Inc., Bush Terminal Building No. 5, Brooklyn, N. Y. 12 pp. 1934. For free distribution.

Since the theory and practice of emulsions is still in a highly disorganized state, the theoretical side is touched on only lightly in this leaflet. A series of important formulae are presented, and emulsifying agents, synthetic resins and waxes, polishes, sprays, etc., are dealt with extensively.

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ELECTRIC HEATING UNITS AND DEVICES. Published by the General Electric Company, Schenectady, N. Y. 56 pp. 1934. For free distribution.

Hundreds of small heating problems that arise daily in industrial plants are answered in this catalog. The company's line of small heating units and devices is well known. Quickly installed at any point, these units handle work that formerly required considerable piping and equipment and proved complicated and expensive.

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PRECISION TOOL ROOM SURFACE GRINDER. Published by the Monarch Machine Tool Company, Sidney, O. 1934. For free distribution.

Attractively illustrated, this catalog describes the company's precision tool room surface grinder in detail, pictures the force feed lubrication feature, and presents the results of a number of tests to illustrate its accuracy and the smoothness of the work it produces.

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AN INDUSTRIAL CROSS SECTION OF OVERHEAD MATERIALS TRANSPORTATION. Published by the Cleveland Tramrail Division of the Cleveland Crane & Engineering Company, Wickliffe, O. 6 pp. 1934. For free distribution.

Thirty-eight types of equipment for overhead handling requirements are graphically illustrated. Such overhead materials transportation systems are familiar to the rubber industry and are in use in many plants.

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THE NEW FITZ MICRO-MANIPULATOR. Published by the Bausch & Lomb Optical Company, Rochester, N. Y. 6 pp. 1934. For free distribution.

The sole purpose of any micro-manipulator is to manipulate small objects or cells in the field of the microscope during observation. An original solution of the mechanical problems involved in micro-operations is offered in this instrument, designed by Dr. G. W. Fitz.

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VANDERBILT NEWS, Vol. 4, No. 2. March-April, 1934 issue. Published by the R. T. Vanderbilt Company, 230 Park Avenue, New York City. For free distribution.

Subjects discussed in this issue are "The Automobile as a Tire Testing Instrument," by A. H. Nellen (Lee); "The Automobile Tire of 1933 and Why It Gives Outstanding Service," by C. R. Park (Firestone); "Accelerator Incompatibility in Adjacent Stocks," and "How and When to Use Bondogen."

Editorial Comment

Plantation Profits

DESPITE the fact that the price of crube rubber last year averaged only 5.96 cents a pound, the United States Rubber Plantations, Inc., managed to report for 1933 a net profit of $79,933. With quotations for the commodity approximately five cents a pound higher this year, it would seem likely that substantially higher and entirely satisfactory profits will be earned by this subsidiary of the United States Rubber Company.

In view of the fact that profits can be earned even with prices at the low levels of 1933 by an efficiently operated organization, the failure of other plantation companies to avoid losses must be ascribed in large part to poor management. Rather than continue to demand a higher price for the commodity, rubber producers might well take steps to improve the efficiency of their own organizations in cultivation and marketing.

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Company Unions

SINCE the inception of the NRA, and particularly since the introduction of the Wagner Bill, considerable comment has been heard from independently managed trade unions to the effect that the worker will be unable to assert his rights under a so-called "company union." Only under the guidance of professional labor leaders, we have been told, can he win his full prerogatives in the New Deal.

This month, however, an employes' organization, said to have been carefully nurtured by the management of the company, ordered a walkout of the workers of a Chicago rubber factory. Upon the decision of this "company union," some 2,000 employes have gone on strike for higher wages.

It would, therefore, appear that workers will act promptly to gain what they believe to be their "rights," whether they are joined in a craft union, operated by outside professional leaders, or whether they are united among themselves in an employe group confined to their particular company. Leadership will always arise to meet the occasion in any such group, and it does not necessarily have to be paid leadership from outside sources.

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Tire Guaranty Repercussions

SALES engineers who have thought that they could sell more tires by issuing a guaranty against blowouts for a certain period may find that warranties of this type can prove a boomerang. One motorist who experienced such a tire accident while driving in the heat of New Mexico last summer is now suing the tire manufacturer for $100,000 on its guaranty.

While reasonable assurance against defects in materials and workmanship may well be promised by any tire builder, it is impossible to foresee the conditions under which a product may be used by the ultimate customer. Even the finest of casings and tubes will not stand up under certain kinds of usage, and unlimited guaranties may for this reason prove dangerous.

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Higher Automobile Prices

MOTOR car manufacturers, raising the wages of their employes, have been quick to pass the cost increase on to the consumer in the form of higher automobile prices. If they are able to secure a better price for their product, the increase in labor charges and costs of materials need not injure their profit statements.

Tire manufacturers have also had their labor and raw material costs sharply increased. Possibly they, too, may be able, after their 40-day price truce, to advance the price of their own product so as at least to compensate themselves for these higher manufacturing costs.

CURRENT • NEWS
of the Rubber Industry

APRIL, 1934

Rubber Division, A. C. S., Spring Meeting Held on March 28-29 at St. Petersburg

Six Interesting Papers Are Presented for Rubber Chemists — Joint Banquet with Paint Division Held, with Sidney D. Kirkpatrick as Speaker

MEMBERS of the Rubber Division of the American Chemical Society held their Spring meeting at the Soreno Hotel, St. Petersburg, Fla., on Wednesday and Thursday, March 28 and 29, in conjunction with the 87th meeting of the society. Three interesting technical papers were presented at morning sessions on each of the two days at the meeting, and important discussions followed the reading of each paper

Those papers read on the morning of Wednesday, March 28, were, in effect, a continuation of the symposium on the progress of chemistry in the rubber industry which was started during the Fall, 1933, meeting at Chicago. The complete list of papers, together with abstracts of the three not included in the symposium, appeared in the March issue of THE RUBBER AGE.

On the evening of Wednesday, March 28, the dinner of the members of the Rubber Division was held in the ballroom of the Soreno Hotel with nearly one hundred in attendance. This dinner was held jointly with members of the Paint and Varnish Division of the society, and the speaker of the evening was Sidney D. Kirkpatrick, editor of *Chemical and Metallurgical Engineering*, whose subject was "Is the Chemist a Human Being?" Other guests at the Division were Dr. Charles L. Parsons, secretary of the American Chemical Society, and Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry*.

An elaborate entertainment program was presented. A ten-piece orchestra provided music, while special buck-and-wing, adagio, acrobatic, Apache and comic dances were offered, together with a chorus of ten dancers. H. G. Bimmerman, of E. I. du Pont de Nemours & Company, acted as chairman of the entertainment committee.

Table favors were presented to all attending the dinner through the generosity of the New Jersey Zinc Company and the General Atlas Carbon Company. Twenty-one prizes, including such valuable gifts as radios and wrist watches, were given to holders of lucky numbers. These prizes were donated by the American Cyanamid & Chemical Company, Binney & Smith Company, E. I. du Pont de Nemours & Company, Krebs Pigment & Color Corporation, Rubber Service Laboratories Company, United Carbon Company and R. T. Vanderbilt Company, Inc.

A business meeting was held by members of the Rubber Division on the morning of Thursday, March 29, following the discussion of the final technical paper presented. There were no sessions of the executive committee.

The next meeting of the Rubber Division will be conducted in connection with the 88th meeting of the American Chemical Society at Cleveland, O., from September 10 to 14.

A. C. S. Paper on Tornesit

A paper on "Tornesit: A New Protective Coating Base" was presented before the Paint and Varnish Division of the American Chemical Society at St. Petersburg on March 28 by E. Mayfield, W. Koch and D. R. Wiggam of the Hercules Experimental Station. Tornesit is the new chlorinated rubber product of the Hercules Powder Company, described on page 17 of this issue.

New York Group to Meet May 18

Members of the New York Group, Rubber Division, American Chemical Society, will hold their next meeting on the evening of Friday, May 18, in the clubrooms of the Building Trades Employers Association, 2 Park Avenue, New York City. Tentative plans are being made for an outing for some Saturday in June.

CHICAGO RUBBER GROUP HEARS A. W. CARPENTER

Members of the Chicago Group of the Rubber Division, American Chemical Society, met on April 13 in the Crystal Room of the Hotel Sherman in that city and heard a talk by Arthur W. Carpenter, manager of the testing laboratories of the B. F. Goodrich Company, on "The Measurement of Quality in Rubber Goods by Physical Tests."

As a second feature of the program, members were enlivened with an exhibition of films of "Africa in the Raw" by J. C. Nichols, noted African hunter.

The meeting was preceded by a dinner in the College Inn of the Hotel Sherman. J. Kirschner is chairman of the Chicago Rubber Group.

GOODYEAR CASE HEARING OPENS AT WASHINGTON

After a recess for two weeks, hearings in the case of the Federal Trade Commission against the Goodyear Tire & Rubber Company on its contract with Sears, Roebuck & Company were resumed April 9 at Washington, D. C. After a week at the capital, the hearings are to be taken to New York on April 16 and to Boston later.

At one session last month J. M. MacMillan, president of the Dayton Rubber Manufacturing Company, testified that his company's sales had fallen off from $6,104,936 in 1927 to $1,953,748 in 1932 and $1,972,638 in 1933, and he attributed a considerable part of the decrease to competition by Sears, Roebuck & Company.

Col. H. V. Eva, former president of the National Tire Dealers Association, testified that the brand of tire given him and other Goodyear dealers to sell in competition with the Sears All-State tires "was inferior in quality and would not meet mail order house competition." He asserted that the public "has come to regard the All-State tire as Goodyear's first line brand rather than Goodyear's All Weather brand, which costs more."

An interesting sideline to the hearings developed when Burgess Darrow, Goodyear development manager, testified that, in order to fill that part of the Sears contract calling for bicycle tires, his company had to "relearn" the business of producing that type of casing. "We had been out of the bicycle tire business for 18 years," he said, "and we had to set up a workshop in the corner and learn again how to make them."

LALLEY REELECTED HEAD OF KELLY-SPRINGFIELD

Despite a vigorous fight waged by opposition stockholders, the present management of the Kelly-Springfield Tire Company was retained by the votes of shareholders at the annual meeting on March 13. Delay in the count of proxies caused several adjournments of the meeting, and it was not until March 17 that the results of the election were made public. The final vote was reported to be

W. H. LALLEY

283,496 for the management against 235,824 for the opposition group led by Thomas B. Finan, president, Footer's Dye Works, Cumberland, Md.; Irving Alexander, of Trenton, N. J., and Bernard F. Curry, president of B. F. Curry, Inc., New York automobile dealer.

The vote elected the same directors as last year, with the exception that the new board includes E. S. Burke and A. F. Eggleston, succeeding Hugh Rankin and Louis Mueller who had accepted nominations on the opposition slate. In addition to Mr. Burke and Mr. Eggleston, the new board includes John M. Hancock, Henry S. Bowers, W. M. Flook, J. K. Newman, J. S. Patterson, Byron E. Hepler, Stephen Peabody and William H. Lalley.

At a meeting of the board of directors the following officers were reelected: William H. Lalley, president; E. S. Burke, vice-president; A. F. Eggleston, treasurer, and H. B. Delapierre, secretary. The executive committee appointd includes J. K. Newman, chairman; John M. Hancock, Henry S. Bowers, W. M. Flook, E. S. Burke and William H. Lalley.

Fire Damages Hankins Plant

A fire at the plant of the Hankins Rubber Company, Massillon, O., caused considerable damage on the morning of March 13. The mixing room and roof of the building as well as equipment and contents were damaged to the extent of approximately $5,000, according to S. B. Hankins, president and treasurer of the company.

Rubber Wage Earnings Higher

More wage-earners were at work in manufacturing industry in February, 1934, than in any other month since October, 1930, and their average earnings, both weekly and hourly, were larger than in any month in the last two years, according to the National Industrial Conference Board. Average weekly earnings of all wage-earners in the rubber manufacturing industry rose from $22.95 in January to $26.19 in February.

Machine Workers Strike

Workers in nine Akron rubber machinery companies have gone on strike, demanding higher wages. The latest group to join the strikers were the 175 employes of the Akron Standard Mold Company, bringing the total number of strikers to about 875. J. I. Barnby, assistant to the general manager of that company, confirmed reports of the strike. J. G. Chalfant, president of the Summit Mold & Machine Company, declared that his organization is still operating.

Dryden Employes Strike

A company union which had been organized by the officials of the Dryden Rubber Company, Chicago, Ill., ordered a walkout by employes of that firm on April 5, and between 1,900 and 2,000 workers failed to report for duty. The workers have asked a 20 per cent wage increase, but George B. Dryden, president of the company, says that the wage increase can not be considered until present contracts for finished goods have been completed.

UNIONIZING ACTIVITY IS CONTINUED IN INDUSTRY

Activity on the part of labor unions to enlist rubber factory workers has continued during the month. Several thousand employes of Akron tire and rubber factories are said to have joined the ranks of the Rubber Workers' Union, and demands for recognition from the companies are being planned.

In an election among employes of the Pacific Goodrich Rubber Company, the Tire & Rubber Workers Union was supported by a vote of 209 to 21 as against the General Committee of Employes. Representation of the workers has, therefore, been allotted to the union, which is affiliated with the American Federation of Labor.

The National Labor Board at Washington heard the dispute between the United Rubber Workers Federal Union and the Eagle Rubber Company, Ashland, O., on April 5 and took the case under advisement. The union claims that the company refuses to discharge its present employes and rehire members of the union who left the company's employ last November.

Violence broke out among striking workers of the Aetna Rubber Company, Ashtabula, O., late last month, and company employes were injured. Nine men were arrested on charges of assault and battery.

OSCAR GROTHE NAMED TO TIRE CODE AUTHORITY

Oscar Grothe, former vice-president of the White Sewing Machine Company, was appointed a member of the Tire Code Authority last month to represent the National Recovery Administration and to take over the duties of A. L. Kress and Col. Robert W. Lea. He will act for the present as the sole representative of the National Recovery Administration, although that body is entitled to three members on the authority under the provisions of the code.

Mr. Grothe has been associated with the White Sewing Machine Company and its parent organization, the White Motor Company, for 25 years. He has also served as vice-president of the American Management Association in charge of the production executives division.

FEBRUARY CONSUMPTION 87% HIGHER THAN 1933

Consumption of crude rubber by manufacturers in the United States for the month of February amounted to 40,609 long tons, which compares with 40,413 long tons for January. This is a slight change over January, 1934, and 87.7% over February a year ago, according to statistics released by the Rubber Manufacturers Association. Consumption for February, 1933, was reported to be 21,638 long tons. Imports of crude rubber for February were 31,032 long tons, a decrease of 32.8% below January but 64.4% above February, 1933.

Total domestic stocks of crude rubber on hand February 28, were 357,094 long tons, which compares with January 31 stocks of 368,660 long tons. February stocks show a decrease of 3.1% as compared with January and were 6.5% below stocks of February 28, 1933.

The participants in the statistical compilation report 53,063 long tons of crude rubber afloat for the United States ports on February 28, compared with 45,768 long tons afloat on January 31 this year, and 32,898 long tons afloat on February 28, 1933.

February reclaimed rubber consumption is estimated to be 7,646 long tons, production 9,504 long tons, stocks on hand February 28, 23,356 long tons.

Sees Smaller Tire Market

While estimating that 13,000,000 tires will be needed for new cars this year as against 9,800,000 tires for original equipment last year, the Alexander Hamilton Institute predicts a smaller replacement tire market owing to the number of old cars being retired from service. "On the basis of an eight-year life," its analysis says, "old cars carried over from 1933 totaled 19,811,000 as compared with a carry over of 22,914,000 cars from the previous year. On the basis of an average replacement of 1.46 tires per car in 1934, which was the replacement average last year, the total number of tires that will be replaced this year will amount to 28,924,000 as compared with 33,387,000 in 1933."

Tire Price War Is Ended by 40-Day Truce; Discount Schedules Fixed for Rival Trades

Agreement Permits Mail Order Companies to Sell 10 to 17½ Per Cent Below List Prices of March 3— Competitive Advertising Is to Be Eliminated

WHAT threatened for a time to be one of the most serious price wars in the tire business was settled early this month by an unusual agreement between mail order firms, tire dealer organizations, manufacturers and the National Recovery Administration. These groups have agreed upon a forty-day truce, during which definite price margins will prevail.

According to a statement by General Hugh Johnson, NRA Administrator, the forty-day truce makes effective the price schedules in the industry existing on March 3. Said by General Johnson to have been signed by 97 per cent of the tire industry, the agreement provides for a tolerance in prices of 10 per cent for mass distributors, and of 12½ per cent for the Western Automobile Supply Company.

Mail order houses had previously demanded that they be permitted to sell tires at prices 25 per cent less than those charged by independent dealers, while the latter had demanded that the margin be no greater than 5 per cent. Retail outlets of the large Chicago mail order houses will be allowed, under the agreement, to undersell regular tire dealers 10 per cent, and in selling tires are not to give the consumer the service of mounting. On actual mail order business—that is, tires sent to the consumer on mailed order—the Chicago firms will be permitted to grant a discount of 17½ per cent below the dealers' prices.

The larger chain tire distributing organizations, operated by tire manufacturers and oil companies, are permitted to sell 5 per cent under the prices quoted by the stores of the mail order firms. The tire manufacturing companies themselves, in order to protect their dealers, are permitted to meet competitive prices of the mail order and chain distributing systems, but such prices are not to be advertised by either. Trade authorities state that under this provision of the tire agreement only the established catalogue prices may be advertised in newspapers and handbills, and not their discounts.

Under the agreement, both sides have agreed to eliminate immediately all forms of so-called "competitive advertising"—without which price wars are not so successfully waged.

Prior to the adoption of the agreement, large Akron tire manufacturers frankly admitted that the price situation in the industry had become "desperate." Penfield Seiberling, sales manager of the Seiberling Rubber Company, charged that in the New York area "eight 10 per cent discounts from standard price lists, the equivalent of 45 to 50 per cent below listed prices," were being offered by mail order interests. Heavy allowances were made for used tires, or, in some cases, a new inner tube was given in exchange for the used casing.

Representatives of seven leading tire companies—Goodyear, U. S., Firestone, Goodrich, General, Kelly-Springfield and Seiberling—held conferences at Akron in early March, together with W. G. Manley, of the Rubber Manufacturers Association. Price control was discussed by this committee, which became known in the industry as the "fire department." In the later part of the month, however, sessions were held at Akron by a group of 19 smaller tire manufacturers independently of the "big four" and a committee of three was named to take the matter directly to the government and the NRA. Acting on this committee were F. A. Seiberling, president, Seiberling Rubber Company; E. S. Burke, vice-president, Kelly-Springfield Tire Company, and A. A. Garthwaite, vice-president, Lee Rubber & Tire Corporation.

Following the adoption of the tire war truce until May 10, it was announced that a committee of three tire company representatives had been appointed to work out the problem of a fair practice code for the retail tire industry. Personnel of this committee was not made public, but it is understood that it includes a sales executive of one large Akron company, as chairman, and executives of two smaller companies.

Flash! Crash! Smash!

"Competitive" advertising, of which this typical sample was recently reproduced in "Advertising Age," will be eliminated by the new tire trade agreement

Reclaimed Rubber Code Approved

Approval of a code for the Reclaimed Rubber Manufacturing Industry was announced April 3 by National Recovery Administrator Hugh S. Johnson. The code is the 377th to be approved. It establishes a basic 40-hour work week and fixes a minimum wage for factory labor of 37½ cents an hour. The minima for offices workers range from $15 per week in cities of more than 500,000 population, to $12 per wek in communities under 2,500. The industry normally employs about 2300 wage earners. The code goes into effect April 16.

V. A. Cosler Joins Du Pont

Announcement has just been made by the Rubber Chemicals Division of E. I. du Pont de Nemours & Company of the appointment of V. A. Cosler, the well known rubber technologist, as technical consultant on the application of DuPrene to mechanical goods. He will also serve as consultant on rubber problems to the various Du Pont industries. Mr. Cosler will make his headquarters in the Wilmington, Del., office of the Du Pont company.

Mr. Cosler has had over 18 years' experience in the mechanical goods industry and is thoroughly acquainted with the methods and materials used in the manufacture of such products. He was with the B. F. Goodrich Company for 14 years, during the last five of which he was technical superintendent of the mechanical goods division. In December, 1930, he joined the Hewitt Rubber Corporation as technical superintendent.

In addition to serving for nine years as a member of the Mechanical Goods Specification Committee of the Rubber Manufacturers Association, he has also been chairman of the Belting Committee of the American Petroleum Institute. Mr. Cosler was a graduate in chemical engineering at Ohio State University in 1916.

NEW ENGLAND NEWS

Wesley I. Charter, from 1925 to 1933 chairman of the board of the National Sherardizing & Machine Company, Hartford, Conn., has been elected president and treasurer, filling the vacancy caused by the death last August of August F. Schoen. Other officers under the present set-up are Frank F. Schoen, vice-president and general manager; John F. Forward, secretary; John E. Johnson, plant superintendent, and John D. Woolam, manager of Akron branch plant.

Mr. Charter has been connected with the corporation since 1917 and Mr. Frank Schoen since 1917. The company's principal products are straight and circular inner tube mandrels, hose mandrels in all size lengths, car coupling hose mandrels, fruit jar mandrels, and stock shells. Mandrels carry the company's sherardizing process. Chrome plating rubber molds and the manufacture of air bag buffing and circular mandrel polishing machines are additional specialties.

Chromium and cadmium plating is done at both plants as a service to the rubber companies as well as making possible a jobbing business locally in Hartford and Akron. Mr. Charter advises THE RUBBER AGE that business for 1934 is better than the corresponding period of 1933, and that prospects for the future under the NRA are good.

A preliminary certificate of dissolution has been filed for the Olympic Reducing Garment Company, New Haven, Conn. Wallace C. Hutton, president of the Seamless Rubber Company, Inc., New Haven, has been designated as receiver of claims against the Olympic corporation.

Stockholders of the Russell Mfg. Company, Middletown, Conn., webbing manufacturers, will hold a special meeting at Middletown on April 18 to act upon a proposal to increase the capital stock by the issue of 4,000 additional shares. As the company's contrast with its new president, G. M. Williams, specifies that under certain conditions he will be given a stock interest as part of his compensation, some additional shares are required. The plant is now operating on a normal basis with good prospects. A strike of 800 employes which threatened for a time to disrupt production has been terminated by an amicable settlement.

Wallace W. De Laney, vice-president of the Seamless Rubber Company, New Haven, Conn., spoke on various phases of rubber goods manufacture at a meeting of the Wallingford, Conn., Rotary Club March 28.

Three units of a new type of tire-building machine for which special advantages are claimed have been completed by B. F. Perkins & Son, Inc., Holyoke, Mass., and regular production of the equipment for use in the tire industry is now planned. Test operations are said to have demonstrated the practical value of the machine, which has been patented.

Employes of the United Elastic Company, Easthampton, Mass., returned to work April 2 after a nine-day strike, settlement of the issues involved having been effected at a long conference March 28. Workers were given a wage increase amounting to approximately 10 per cent and the question of union recognition was left in abeyance. The agreement was signed by H. W. Conant, assistant treasurer of the corporation, and George Picard, representative of the United Textile Workers of America.

A number of manufacturers producing rubber goods or rubber processing equipment will have exhibits at the forthcoming Prosperity Exposition which will open at Bridgeport, Conn., on May 4. The exposition will be held in a building of the former Locomobile Co. of America plant which contains 100,000 square feet of space on one floor.

The Essex Wire Corporation, Detroit, Mich., is preparing to close the New York Insulated Wire Company plant in Wallingford, Conn., owing to lack of business and difficulties over taxation. The shutdown, scheduled about the 20th of April, will be permanent, according to Addison E. Holton, president.

Last year the corporation secured an abatement of taxes from the Borough of Wallingford which was conditioned on the reopening of the plant and maintaining an average working force. The company has not been able to use this number of employes and is now liable for its taxes in full. Before being operated by the New York Insulated Wire Co., which was taken over by Essex, the plant was occupied by the Metropolitan Rubber Company.

Goodyear Rubber Company, Middletown, Conn., rubber footwear manufacturers, increased its operating schedule by adding an extra shift on April 5. About 650 hands are now employed.

Twenty buffers employed by the Schavoir Rubber Company, Stamford, Conn., staged a brief and unexplained walkout recently. The trouble was soon adjusted and production was not seriously affected. Mrs. K. F. Schavoir reported that most of the strikers had returned to work, but a few had been replaced.

Damage estimated at $4,000 was caused in a lacquer storage room at the plant of Richards & Company, Stamford, Conn., March 22. Static electricity setting fire to "thinner" was blamed for the blaze, which for a time threatened serious consequences.

Stockholders at the first annual meeting of the reorganized Fisk Rubber Corporation on March 21 re-elected four directors of the company's revolving board of ten, those re-named being Orrin G. Wood, John C. Traphagen, Charles A. Dana and Edward D. Levy, president. At the request of minority stockholders, directors voted to abolish the office of chairman of the board, which paid a salary of $12,000 a year. A contract between the company and Mr. Levy, read at the meeting, disclosed that he is to be retained until October 1, 1936.

TRENTON NEWS

Frank Bernstein, president of the Puritan Rubber Company, Trenton, has been spending some time in Miami, Fla.

Joseph Stokes Rubber Company, Trenton, recently completed a new plant addition. The concern has erected two new factory units during the season.

General C. Edward Murray, president of the Crescent Insulated Wire & Cable Company, Trenton, has tendered his resignation as a State official to Governor A. Harry Moore to take effect April 5. He will devote his time to business interests.

Hamilton Rubber Company, Trenton, is busy on orders for cotton hose and has added a number of new employes to that department.

Wearever Rubber Industries, Inc., of Bridgeton, N. J., has been chartered with 20,000 shares no par to manufacture rubber products. Douglas V. Aitken, Syd Detel and Hazel Dalton, all of Bridgeton, are the incorporators.

Ayvad Water Wings, Inc., of 1021 Grand Street, Hoboken, N. J., has been incorporated at Trenton with 100 shares no par to manufacture rubber water wings, life preservers, belts and bags. The incorporators are Hachig A. Ayvad, Eleanor Riordan and Rudolph H. Oetting, all of Hoboken.

C. Edward Murray, Jr., of Princeton, vice-president of the Crescent Insulated Wire & Cable Company, Trenton, and former head of the Murray Rubber Company, is cruising with Mrs. Murray in the West Indies and South America.

Two rubber company officials have returned from business trips through the far west. Bevis Longstreth, president of the Thiokol Company, Yardville, spent some time in California. William H. Sayen, president of Mercer Rubber Company, Hamilton Square, toured several of the western states.

Names in the News

T. D. CABOT, treasurer of Godfrey L. Cabot, Inc., Boston, Mass., returned recently from a two months' stay in Europe, during which he visited the principal manufacturing centers of England, France, Austria and Germany. On his return he predicted that the upward trend of carbon black consumption in Europe during the past four years would continue in 1934.

DR. H. L. TRUMBULL, director of chemical research, B. F. Goodrich Company, has been selected by the National Research Council to prepare a survey on 1933 achievements in rubber chemistry. Dr. Trumbull's paper will be printed in an annual review of chemistry now being compiled.

E. V. PETERS was elected a vice-president of the St. Joseph Lead Company at a meeting of the board of directors held last month.

HENRY SCHIPPEL, design and development engineer in the tire division of the B. F. Goodrich Company, read a paper on "Uses of Rubber for Transportation" before the St. Louis Section of the Society of Automotive Engineers in St. Louis, March 22.

GORDON COLLINS, formerly chemist at the E. H. Clapp Rubber Company, Hanover, Mass., is now associated with the reclaiming division of the Naugatuck Chemical Company in the laboratory and sales service, with headquarters at Naugatuck, Conn.

DR. WOLFGANG KLEMPERER, research expert for the Goodyear-Zeppelin Corporation, gave an illustrated lecture on three-dimensional pictures at Akron University, Akron, O., on March 27.

EDWIN B. NEWTON, of the chemical research staff of the B. F. Goodrich Company, has left for Singapore to engage in studies of latex and crude rubber preparation in the Far East. Mr. Newton, who has been associated with Goodrich for nine years, has been connected, from the beginning, with the development of the company's Anode process for producing articles directly from latex.

ALFRED W. BARRY has joined the General Tire & Rubber Company in a sales capacity. Mr. Barry was until three months ago vice-president and general sales manager of the Kelly-Springfield Tire Company.

DR. ERNEST BLAKER, of the research department of the B. F. Goodrich Company, has been named president of the general council of the company's office employes co-operative plan.

DR. WEBSTER N. JONES, former general superintendent of the processing division of the B. F. Goodrich Company, and now head of the engineering department of the Carnegie Institute of Technology, Pittsburgh, Pa., played a leading role in the dedication of the new chemical engineering research school there last month. Several of his former associates at Akron attended the ceremonies.

EBERHARD FABER, president of the Eberhard Faber Rubber Company, Newark, N. J., celebrated his 75th birthday on March 14, shortly after returning north from his winter home at Pinehurst, N. C.

PAUL W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, returned to Akron March 23 after a short visit with Mrs. Litchfield at Litchfield Park, Arizona. He came home by way of Chicago, returning with L. E. JUDD, director of public relations of the company.

H. W. DELZELL, manager of technical service, B. F. Goodrich Company tire division, addressed an industrial group in Syracuse, N. Y., last month, speaking on the subject of tire construction.

JOHN L. COHILL, vice-president and general manager of the Firestone Tire & Rubber Company of Argentina, arrived in Akron March 17 on a visit to his organization's headquarters. He reports greatly improved business conditions in Argentina.

FRANK T. TUCKER, B. F. Goodrich Company manager of tire and battery advertising, addressed the Advertising Club of the Columbus Chamber of Commerce at Columbus, O., last month.

H. D. JAMES, control expert and long a consulting engineer of the Westinghouse Electric & Manufacturing Company, has opened an engineering consulting service, specializing in building and industrial problems, at 1532 Gulf Building, Pittsburgh, Pa.

R. F. MOODY, production superintendent of the Euzkadi Manufacturing Company, Mexico City, largest producer of rubber goods in Latin America, was a visitor to Akron last month.

W. E. FOUSE, vice-president, General Tire & Rubber Company, has been appointed a member of the finance committee of the Better Akron Federation. Other members include FRED M. HARPHAM, vice-president of the Goodyear Tire & Rubber Company; B. M. ROBINSON, Firestone Tire & Rubber Company, and T. B. TOMPKINSON, comptroller and vice-president, B. F. Goodrich Company.

GUY GUNDAKER, JR., manager of the B. F. Goodrich Company sales promotion division, will address the Exchange Club of Wadsworth, O., on modern selling methods on April 19.

J. G. ROBERTSON, former treasurer of the Firestone Tire & Rubber Company, was elected president of the American Vitrified Products Company, Akron, O., last month.

FRED M. HARPHAM, vice-president of the Goodyear Tire & Rubber Company, spoke before members of the Akron Real Estate Board on March 26. His subject was "The Water Situation in Akron."

M. G. HUNTINGTON, advertising and sales promotion manager of associated tire lines, the B. F. Goodrich Company, left Akron March 15 for a trip to the Pacific coast, where he will contact distributors in all major cities.

G. A. SACKETT, research chemist of the Goodyear Tire & Rubber Company, spoke before a meeting of the Exchange Luncheon Club, Akron, O., last month. Mr. Sackett, who only recently returned from three years in the Dutch East Indies, discussed "Life in the Far East."

V. I. MONTENYOHL, treasurer, and S. M. JETT, secretary of the B. F. Goodrich Company, returned to Akron last month from a business trip abroad. They were accompanied on part of their trip by D. M. GOODRICH, chairman of the Goodrich board of directors.

CLYDE E. SCHETTER, of the Goodyear Tire & Rubber Company and Goodyear-Zeppelin Corporation, addressed a joint meeting of the Ashland Young Business Men's Club and the Mansfield Hermit Club at Ashland, O., on March 28.

JOHN H. HAYES, formerly with the Goodyear Tire & Rubber Company, is now associated with the works laboratory of the National Carbon Company, Niagara Falls, N. Y.

PROSPER E. CHOLET, well known rubber technologist, is now connected with H. Muehlstein & Company, New York City, in charge of development and research on rubber latex.

DAVID ADAMS has been appointed district sales manager at Pittsburgh, Pa., for the Falk Corporation, Milwaukee, Wis. He succeeds W. O. BEYER, who recently resigned to become a member of the Pittsburgh Civil Service Commission.

F. B. DAVIS, JR., president of the United States Rubber Company, is now serving as a member of the Industrial Advisory Board of the National Recovery Administration.

RALPH H. MINER, tax expert at the Goodyear Tire & Rubber Company, addressed a meeting of Ohio State University alumni at the Akron City Club April 2 on the subject of "State Tax Problems."

D. S. VILLARS has become associated with the United States Rubber Company at Passaic, N. J., in the capacity of physical chemist. He was previously connected with the Standard Oil Company at Whiting, Ind.

Financial News

PENNSYLVANIA RUBBER NETS $128,442 IN 1933

Report of the Pennsylvania Rubber Company, Jeannette, Pa., for the year ended December 31, 1933, shows a net profit of $128,442 after provision for depreciation in the amount of $194,488 and the payment of excise taxes in excess of $458,000. For 1932, the company reported a net income of $30,044 after taxes and charges.

The strong financial position of the company was maintained, working capital having been increased $158,573 during the year. The company has no bank loans, and is one of the few in the tire industry to report net earnings for each of the four years of the depression.

Directors and officers were re-elected at company meetings on March 28.

SERVUS RUBBER COMPANY EARNS $49,633 DURING 1933

The Servus Rubber Company, Rock Island, Ill., reports for the year ended December 31, 1933, a net profit of $49,633. Gross profits for the year amounted to $472,497 as against $329,911 for 1932. The company also reports a loan reduction of $160,000 in the course of the year.

Carl A. Hallgren, president of the company, was re-elected, as were all other officers. M. E. Strieter was named a director to fill the vacancy caused by the retirement of H. W. Litten.

I. B. KLEINERT RUBBER PROFIT IS $69,718 IN 1933

Report of I. B. Kleinert Rubber Co. and domestic subsidiaries for year ended December 31, 1933, certified by independent auditors, shows net profit of $69,718 after depreciation, provision for losses of foreign subsidiaries and federal taxes, equivalent to 38 cents a share (par $10) on 181,539 shares of capital stock. This compares with net loss of $248,414 in 1932.

Current assets as of December 31, 1933, were $1,507,015 and current liabilities were $270,418 compared with current assets of $1,481,052 and current liabilities of $265,037 at end of preceding year.

BRITISH GOODRICH CO. EARNS $519,352 IN 1933

The annual report of the British Goodrich Rubber Company, Ltd., Loyland, England released recently by Sir Walrond Sinclair, chairman and managing director, showed a net profit after all charges of $519,352 for 1933 compared with a profit of $417,432 for 1932.

A dividend of six and a half per cent was paid during 1933 compared with a five per cent dividend for each of the three preceding years.

Textileather Loses $58,570

The Textileather Corporation, Toledo, O., reports for 1933 a net loss of $58,570 after interest, amortization, depreciation, expenses and other charges. This compares with a net loss of $218,738 in 1932.

Aetna Rubber Loses $69,059

The Aetna Rubber Company, Ashtabula, O., reports for the year ended December 31, 1933, a net loss of $69,059 after depreciation and other charges. This compares with a net loss of $82,001 in 1932.

American Hard Rubber Profit

The American Hard Rubber Company reports for the year of 1933 a net profit of $60,340, equivalent to $2.66 a share on the 22,682 preferred shares outstanding. This compares with a net loss of $412,893 during 1932.

Midwest Reclaiming Shows Loss

The Midwest Rubber Reclaiming Company, East St. Louis, Ill., controlled by the Akron Rubber Reclaiming Company, reports for the year ended October 31, 1933, a net loss of $18,554. This compares with a net loss of $81,047 in the preceding fiscal year.

Garlock Earns $374,107

Net income of the Garlock Packing Company for the year ended December 31, 1933, was $374,107 after taxes, depreciation and other charges. This compares with a profit of $75,221 in 1932.

General Cable 1933 Loss

The General Cable Corporation and subsidiaries report for 1933 a net loss of $2,044,186 after interest, depreciation, etc., including a special charge of $178,236 to reduce the inventory to a basis of normal production. This compares with a net loss of $5,023,840 in 1932.

UNITED CARBON COMPANY EARNS $636,217 IN 1933

The United Carbon Company has reported for the year ended December 31, 1933, net profit of $636,217 after depreciation, depletion and other deductions, but before federal taxes. This compares with profit of $145,643 in 1932. Oscar Nelson, president, declared that with prevailing higher prices and satisfactory gas deliveries the management expects the current year to show a considerable improvement in earnings.

Tonnage sales of carbon black registered a new high record in 1933, with shipments 63 per cent ahead of those for 1932, says Mr. Nelson, adding that United expanded its trade position, supplying about 27 per cent of all carbon black consumed. Practically all the company's idle plants are being placed in operation again to meet the growing demand. United has the largest quota of any producer in the Carbon Black Export, Inc., organized under the Webb Act.

SEIBERLING RUBBER CO. LOSES $334,116 IN 1933

Seiberling Rubber Co. and subsidiaries in report for fiscal year ended October 31, 1933, showed loss from operations of $2,962 after charges and depreciation, but before provision for loss on accounts receivable from Willys-Overland Co., loss on cotton futures and on investments and restricted balances, all totaling $331,154. Including the latter charges, deficit for year ended October 31, 1933, was $334,116. In preceding year company reported net loss of $32,343 after interest, depreciation, etc.

Current assets as of October 31, last, amounted to $2,598,729, and current liabilities were $871,330, comparing with $2,485,777 and $577,323 respectively, at close of previous year. Surplus at close of year, after crediting the account with $2,439,954 surplus resulting through reduction of stated value of common stock from $10 to $1 per share, amounted to $1,459,958 as compared with $430,533 on October 31, 1932.

GOODYEAR OF CALIFORNIA LOSES $300,432 IN 1933

Goodyear Tire & Rubber Co. of California, Inc., and wholly owned subsidiaries report for year ended December 31, 1933, net loss of $300,432 after depreciation, interest and taxes, comparing with net loss of $200,514 in 1932.

Goodyear Textile Mills Co., controlled by Goodyear Tire & Rubber Co. of California, report for year ended December 31, 1933, net profit of $135,844 after charges and taxes, comparing with $134,842 in preceding year.

NATIONAL MACHINERY CO. LOSES $57,762 DURING 1933

A 16 per cent increase in business last year, over the 1932 record, was shown in the annual report of the National Rubber Machinery Company.

The net loss of the year was $57,762 compared with $210,949 for the previous year. President S. W. Harris predicted a fair profit for this year, through operation of NRA. Sales for last year were $1,012,485. Total depreciation, including that for non-operating plants, was placed at $64,869.

Intercontinental Loses $172,453

The Intercontinental Rubber Co. reported that for 1933 there had been a net loss to surplus of $172,453, as compared with a loss of $471,992 for the previous year. The president said in his letter to stockholders that the improvement resulted from a higher price for rubber, further economies and a better market for short-term notes in which part of the companies' funds had been invested several years ago.

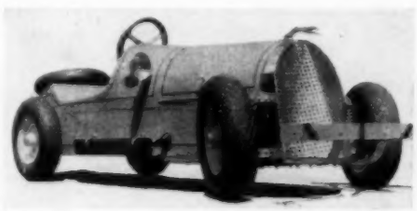
New Rubber Goods

Two New Goodrich Tubes

The B. F. Goodrich Company has just introduced its new Black and Gold inner tube, made of specially compounded gold and black rubber in two sections. First, the entire tube is made of one tough rubber stock, and then a layer of abrasion resisting rubber is vulcanized over the inside circumference of the tube. This strip is made to give resistance to chafing at points where the most chafing occurs, and the tube will, therefore, not be cut to ribbons if run flat. A second addition to the Goodrich line is a puncture-sealing tube under the name of the Seal-O-Matic. Different in construction from previous products of this type, it incorporates a layer of plastic gum rubber inside the tube wall. This rubber, specially compounded for this one purpose, flows into any hole that may be driven into the tube without allowing the tube to lose its air.

Custer Juvenile Automobile

A real automobile in miniature that will run 12 miles an hour and go 65 miles on a gallon of gasoline is being offered for the juvenile market by the Custer Specialty Company, Inc., 119 Franklin Street, Dayton, O. Seven feet in length, the car is powered by a ½ H.P. gasoline engine, has two speeds—one forward and one reverse—a brake, ball bearing wheels, and 16 x 4 Goodyear tires. It has a three-point chassis mounting and has individually sprung front wheels. Another model is electric-driven.



Honey Center Golf Ball

The L. A. Young Golf Company, Detroit, Mich., has introduced the Hagen Honey Center golf ball, in which honey is used as a center fluid. The high specific gravity of the honey makes the addition of any weighing element unnecessary, and the elimination of any weighing element in the center fluid assists in producing perfect balance. Non-evaporation of the honey gives constant and uniform performance under all conditions.

Vultex Impregnated Mesh Shoe

The Cambridge Rubber Company, Cambridge, Mass., has introduced an entirely new woman's shoe, constructed of Vultex impregnated mesh. The company states that the Vultex processing of mesh will resist fraying, abrasion and moisture to such a degree that the shoes may be cleaned with ordinary soap, water and scrubbing brush. While the mesh fabric is delicate in appearance, the Vultex process strengthens each little strand without changing the surface aspect. The sole as well as the rubber trims are actually locked or impregnated into the uppers by a new pressure process.

Foot-Flex Shoe

Under the name of the Foot-Flex shoe, the Stacy-Adams Company, Brockton, Mass., is offering footwear for men with a patented innersole which is split for half its length and, in bending with each step, conforms to the arch of the foot in such a way that a sense of complete support is enjoyed by the wearer. An adjustable metatarsal sponge rubber pad is inserted under this innersole and may be easily and quickly placed at the precise point necessary for the individual foot.

General Silent Safety Tire

The new Silent Safety casing, introduced by the General Tire & Rubber Company, Akron, O., is said to incorporate the advantages of both the rib tread and the non-skid tread and to discard the disadvantages of both of them. A novel winding, twisting, entirely irregular tread design provides against slipping or sliding because there is no continuous skid-groove in any direction. In addition to safety, the new tread offers silence in operation because of its special design.

Musselman Ground Glider

Equipped with 10 x 2¾ Musselman "Doenut" pneumatic cord tires, this scooter is designed to permit riding over almost any ground. The tires use ten pounds of air pressure for the ordinary child, and the wheels have adjustable ball bearings. It is said that it actually takes one-third less energy to propel than any similar machine with ordinary tires, and it will glide three times as far as any other scooter. The manufacturer is Alvin J. Musselman, Cuyahoga Falls, O.

HERRON & MEYER OPEN N. Y. PIGMENT DEPT.

Herron & Meyer, Inc., announce the opening of a pigment department in their New York City office, located at 82 Beaver Street, under the direction of W. A. Herron, brother of John W. Herron, president of the company.

Dr. H. A. Flint, former eastern technical sales representative for Philadelphia Rubber Reclaiming Company, will act as technical consultant for the company's business in the East. Dr. Flint, who has been active in the rubber industry for 18 years, also was associated with E. I. du Pont de Nemours & Company and the Pequanoc Rubber Company before he joined Herron & Meyer, Inc., in 1931.

Herron & Meyer, Inc., in addition to their established crude rubber business, are actively engaged in the sale of such well known products as Gastex and Palmer carbon blacks, and Crown Brand clay.

SCRAP RUBBER DEALERS ASSEMBLE IN NEW YORK

The 21st annual convention of the National Association of Waste Material Dealers, Inc., together with the annual meeting of the Scrap Rubber Institute and its other affiliates, was held at the Hotel Astor, New York City, from March 19 to 21. George Birkenstein, of S. Birkenstein & Sons, Inc., Chicago, Ill., was elected president of the association, and Julius Muehlstein, of H. Muehlstein & Co., Inc., New York City, was among those chosen as directors.

The Scrap Rubber Institute, which has taken the place of the old Scrap Rubber Division of the association, was in session throughout a part of the convention period, and its executive committee discussed at length the part it must play in the selection of a code authority for the scrap rubber trade. Nat E. Berzen, of Nat E. Berzen, Inc., New York, N. Y., was elected president of the Scrap Rubber Institute. E. B. Friedlander, the Loewenthal Company, Chicago, Ill., was named vice-president, and Charles M. Haskins was elected secretary-treasurer. Executive committee members are M. F. Berg, Southern California Waste Materials, Inc., Los Angeles, Cal.; H. H. Cummings, Wm. H. Cummings & Sons, New York, N. Y.; David Feinburg, David Feinburg Company, Medford, Mass.; Samuel Greenfield, Samuel Greenfield Company, Inc., Buffalo, N. Y.; A. Lowenstein, Newark, N. J.; Herman Muehlstein, H. Muehlstein & Company, New York, N. Y., and Alex. Schulman, A. Schulman, Inc.

Named as the Institute's representatives on the Code Authority were E. B. Friedlander, the Loewenthal Company, Chicago, Ill.; Julius Muehlstein, H. Muehlstein & Company, New York, N. Y.; A. Schulman, A. Schulman, Inc., Akron, O., and Samuel Greenfield, Samuel Greenfield Company, Inc., Buffalo, N. Y., and, as a mixed dealer, Aaron Pollack, Pollack Brother Scrap Rubber Corporation, Brooklyn, N. Y.

Meeting at Washington April 10, this group named Mr. Friedlander as chairman, Mr. Schulman vice-chairman, Mr. J. Muehlstein treasurer and Mr. Haskins secretary and assistant treasurer of the Authority.

H. Muehlstein & Co. to Move

H. Muehlstein & Company, Inc., dealers in crude and scrap rubber, will move about April 15 from their present quarters at 41 East 42nd Street to 122 East 42nd Street, New York City. Their new 'phone number will be AShland 4-2901.

Coste Forms New Firm

Paul Coste, manager of rubber floor activities for the United States Rubber Company since 1929, has left that organization to form the firm of Paul Coste, Inc., at Providence, R. I., for the manufacture and sale of rubber flooring. It is understood that Mr. Coste's new organization will take over the rubber flooring activities of the United States Rubber Company as soon as negotiations have been completed. J. C. Knowles and J. B. Littlefield, in addition to Mr. Coste, are listed as incorporators of the new company, which has a capitalization of $30,000.

O'SULLIVAN RUBBER CO. INCREASING ITS SALES

The O'Sullivan Rubber Company, manufacturer of rubber heels at Gettysburg, Pa., and Winchester, Va., has declared an initial dividend of 10 cents a share on the $1 par value common stock. The dividend is payable June 30 to stock of record May 31.

The company reports gross sales for January, February and the first 20 days of March as $304,644. This compares with sales of $168,247 in the corresponding period of 1933 and represents an increase of 81.08 per cent. As of March 12, the company increased the net sales prices to the repair trade on its "O'Sullivan's" brand ½-inch men's heels from 72.87 cents to 80.55 cents per dozen pairs and advanced quotations on certain other lines accordingly.

OSBORN TO DIRECT SALES OF VULTEX CHEMICAL CO.

K. B. Osborn has recently been promoted to sales manager of the Vultex Chemical Company, manufacturing and selling subsidiary of the Vultex Corporation of America. Mr. Osborn was associated with the Hood Rubber Company from 1916 to 1924, during which time he spent two years in Singapore looking after the firm's crude rubber interests. He then joined the importing firm of Washington Dean Company, Inc., New York City, in its trading department and as a member of the board of directors, before starting his connection with the Vultex organization in 1929. Mr. Osborn will have his headquarters at the company's main office at 666 Main Street, Cambridge, Mass.

F. C. Batchellor, in addition to covering the New York metropolitan and northern New Jersey districts will handle all of New Jersey and the Philadelphia territories, replacing Robert Loveland who is being transferred to the New England district.

L. D. TOMPKINS TO HEAD U. S. TIRE DEPARTMENT

L. D. Tompkins, vice-president of the United States Rubber Company, was recalled last month from his work in the National Recovery Administration to become acting general manager of the company's tire department. He succeeds Joseph F. O'Shaughnessy, who resigned March 6. Howard N. Hawkes has been named general sales manager of the tire department, replacing L. M. Simpson who retired from the company the day following O'Shaughnessy's resignation.

Mr. Tompkins has been an outstanding figure in the United States Rubber Company for years, leaving the industry temporarily last year to handle important NRA work directly under General Johnson. Mr. Hawkes has been with the company since 1912.

H. F. Newell has been advanced from his post as manager of distributing branches to be assistant to Mr. Tompkins. R. Emmet Sheahan, who has been manager of automotive sales for the company in Detroit for the past five years, has been given wider responsibilities as the head of all tire operations at Detroit.

NEWTON D. BAKER NAMED DIRECTOR OF GOODYEAR

Newton D. Baker, Cleveland attorney and Secretary of War under President Wilson, was elected a director of the Goodyear Tire & Rubber Company at the annual stockholders' meeting on March 26. P. E. H. Leroy, Goodyear vice-president and treasurer, was also named a director. They succeed Thomas H. White and Robert L. Clarkson.

Mr. Baker has also been selected to act as a member of the company's executive and finance committee, the personnel of which was reduced from nine to five members. Those continuing on this committee are President P. W. Litchfield, Vice-Presi-Clifton C. Slusser, Grayson M.-P. Murphy and E. B. Greene. Those dropped from the committee are Francis Seiberling, J. R. Nutt, George T. Bishop, Robert L. Clarkson and G. A. Tomlinson. All officers of the company were re-elected.

Cabot Adds New Tank Cars

Five new self-clearing gravity type tank cars for the handling of carbon black in bulk have been shipped from the Berwick plant of the American Car & Foundry Company to plants of Godfrey L. Cabot, Inc., in the Texas Panhandle, bringing the number in the Cabot fleet up to ten. All the cars bear the identifying Cabot black cat in a white circle and the trade name of Spheron.

Dayton to Build New Warehouse

The Dayton Rubber Manufacturing Company, Dayton, O., is erecting a new two-story warehouse of brick, stone and concrete construction. The new unit will be the second of its kind, the first having been erected last year. It will furnish 12,000 square feet of floor space and will cost approximately $15,000.

Obituaries

Alton Farrel

Alton Farrel, former treasurer of the Farrel-Birmingham Company, Ansonia, Conn., died at his home in New Haven, Conn., on March 28 after a year's illness. He was 54 years old and had been treasurer for about 20 years of the Ansonia company, which was founded by his uncle, Franklin Farrel.

Born in Ansonia, he was graduated from St. Paul's School and from Yale University. He had been Mayor of Ansonia, a member of the military staff of Governors Chamberlain and Holcomb, and State Senator from the Seventeenth district, which includes Ansonia. He had been a member of many clubs and fraternal organizations.

Surviving are his widow, three children, Alton, Jr., Robert and Jean; a sister, Mrs. B. Austin Cheney, and an aunt, Mrs. Rutherford Trowbridge, all of New Haven.

Victor Guinzburg

Victor Guinzburg, chairman of the board of the I. B. Kleinert Rubber Company, died on March 23 at his home in Chappaqua, N. Y., after a three-year illness. He was 72 years old.

Mr. Guinzburg was a native of Annapolis, Md. At the age of 25 he was furniture buyer for Bloomingdale Brothers, New York department store, and two years later he resigned to go into business with his father-in-law, the late I. B. Kleinert.

He developed a number of formulae and processes on which he held patents. During the World War he devoted himself to improving a gas mask material which would be more effective than any in use by the allied armies. His formulae were presented to the government with suggestions as to the plants best equipped to develop them.

For many years Mr. Guinzburg was president of the Kleinert Company. He resigned on January 1, 1929, to become chairman of the board, but for the past three years he had been inactive because of illness.

He is survived by his widow, Henrietta Kleinert Guinzburg, and three sons, Ralph K. Guinzburg, president of the I. B. Kleinert Rubber Company; George K. Guinzburg, vice-president, and Frederic V. Guinzburg, a sculptor.

Arthur B. Salinger

Arthur B. Salinger, Sr., secretary of the I. B. Kleinert Company, died on March 11 at the age of 70. He had been with the Kleinert organization for 40 years. Funeral services were held on March 13, and the offices of the company were closed during the afternoon of that day in respect to his memory.

Earl W. Ellison

Earl W. Ellison, secretary-treasurer of the Fairfield Rubber Company, Lancaster, O., died suddenly at his home in that city on March 10. Mr. Ellison, who was 44 years old, was also treasurer of the H. C. Godman Shoe Company and president of the H. C. Godman Building & Loan Society. He is survived by his widow, a daughter, one brother and two sisters.

William Hancock

William Hancock, sales manager of the Kemitex Products Company, was killed in an automobile accident on March 16 while on a business trip in Providence, R. I. He was 37 years old, and had for several years been associated with the Kemitex organization, a subsidiary of the Seiberling Rubber Company, which manufactures rubberized fabrics at Wadsworth, O.

F. C. Lee

F. C. Lee, advertising man in charge of copyrights at the Goodyear Tire & Rubber Company, Akron, O., was killed together with his wife when he attempted to drive over a grade crossing at Bedford, O., ahead of a fast Pennsylvania train on March 27. The accident occurred as Mr. and Mrs. Lee were driving to Cleveland to see their son, Kent, a sophomore at Adelbert College, Western Reserve University.

Jacob A. Wasserman

Jacob A. Wasserman, secretary and general manager of the Acme Backing Corporation, manufacturer of rubberized fabrics at Brooklyn, N. Y., died of double pneumonia at his home in Mount Vernon, N. Y., on March 11. He was 47 years old. Surviving are his widow and two sons.

David A. Ducharme

Funeral services were held at Akron last month for David A. Ducharme, service engineer of the Farrel-Birmingham Company, Inc., who was one of the nine victims of a railroad wreck at Pittsburgh, Pa. His complete obituary appeared in the March issue of THE RUBBER AGE.

William E. Gibbs

William E. Gibbs, who is credited with the invention of the tire valve now used on every automobile and bicycle, died at his home in East Orange, N. J. He sold his valve patent for a small sum years ago. He also held patents for acetylene lights, oil burner improvements and other products.

U. S. RUBBER CONSIDERS NEW FINANCIAL CHANGES

Stockholders of the United States Rubber Company will consider several new financial changes at their annual meeting on April 17 at Jersey City, N. J., including the granting of a stock purchase option to F. B. Davis, Jr., president of the company.

Reduction of the price at which company shares are offered to the Managers Shares Trust from the present figure of $35 will be considered. Action will be taken on a proposal to grant Mr. Davis an option to purchase 20,000 shares of common stock, the option to continue until May 1, 1939. In the case of Mr. Davis and the Managers Shares Plan, it is stipulated that the price at which the company's stock is sold shall be not less than $20 a share.

Shareholders will also consider the adoption of the Retirement and Savings Plan of the company, instituted in 1931, which provides for the guaranty by the company of the principal of savings of employes with interest at 4 per cent.

Canadian Goodyear Dividend

With the payment of a quarterly dividend of $1.25 on April 2, the common stock of the Goodyear Tire & Rubber Company of Canada was raised to a $5 annual dividend basis. The stock was formerly receiving disbursements at the rate of $4 a year.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, APRIL 10, 1934

Crude Rubber

DURING March price ranges on spot rubber ranged from 10 7/16 cents on the first to 11 5/8 cents on the 12th, with an average for the month of 11.01 cents compared to 10.45 for February. Since the beginning of this month however the tendency has been upwards with a high of 11¾ cents reported today. This is the highest spot quotation since July 10, 1930 when the same quotation was reported. It is believed that the market is in for a continued rise based somewhat on the expectation of a continuance of the high demands of rubber factories here and the expectation of a definite announcement on restriction. It is reported from abroad that quotas have been agreed on and that the Dutch are now awaiting British action. Quotations on the Exchange, outside market, London and Singapore follow:

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.11¾
April	—	@	.11¾
July-Sept.	—	@	.12⅛
First Latex, crepe spot	—	@	.12¾
Amber Crepe, No. 2	—	@	.09¾
Amber Crepe, No. 3	—	@	.09⅝
Amber Crepe, No. 4	—		.09⅛
Brown Crepe, clean thin	—	@	.09¾
Brown Crepe, rolled	—	@	.07½

Latex—

Liquid Latex, per gal.	.72	@	—

Paras—

Up River, fine	—	@	.10½
Acre Bolivian, fine	—	@	.10¾

Balata—

Block, Ciudad	—	@	.35

LONDON MARKET

Standard Smoked Sheets—Buyers—April 10

April	—	@	5 11/32d
July-Sept.	—	@	5 13/32d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—April 10

April	—	@	5 3/32d
July-Sept.	—	@	5 5/32d

Reclaimed Rubber

Reclaimers continue to report a good demand from rubber manufacturers and the trade is expecting a continuance of this condition for some time to come. Scrap rubber is firm with an upward tendency and the reclaim prices quoted below are nominal in view of the crude rubber trend. Consumption figures for February show an increase of 646 tons over the previous month, with the percentage of reclaim to crude increased to 18.8 from 17.3% in January. Quotations follow:

High Tensile

Super-reclaim, black	.08¼	@	.08½
High Tensile Red	.07	@	.07¼

Shoe

Unwashed	.06½	@	.06¾
Washed	.08	@	.09

Tube

No. 1 (Floating)	.12	@	—
No. 2 (Compounded)	.07½	@	.07¾

Tires

Black	.05	@	.05¼
Black, selected tires	.05¼	@	.05½
Dark Gray	.06¼	@	.06½
White	.08	@	.08¼
Truck, Heavy Gravity	.05¼	@	.05½
Truck, Light Gravity	.05¾	@	.06

Miscellaneous

Mechanical blends	.04	@	.04¼

Scrap Rubber

The market for scrap rubber has continued active with demand from reclaimers holding up well. Quotations are somewhat easier as a result of the larger supplies being made available after the winter's snows had disappeared. It is felt however that as crude rubber advances, scrap will follow along at higher levels. Quotations follow:

(Prices to Consumers-

Auto tire peelings	ton 19.00	@	20.00
Mixed auto	ton 11.00	@	12.00
Clean solid truck tires	ton 35.00	@	37.50
Boots and shoes	ton 25.00	@	27.50
Arctics, untrimmed	ton 20.00	@	22.50
Inner tubes, No. 1	.05¼	@	.05½
Inner tubes, No. 2	.03¼	@	.03½
Inner tubes, Red	.02½	@	.02⅝

Cotton

Spot cotton has continued firm since our last report with quotations varying in the limited range from 12.00 to 12.50 cents. The average price for March was 12.30 as compared to 12.28 in February. Futures closed higher today after a short rise, May position being quoted at 12.04, up 10 points overnight but still under the 12.16 of March 10 and 12.27 of February 9. Reports from Washington indicate the elimination of the 6-bale amendment to the Bankhead bill. Several more conferences are expected to be held before the bill is reported out of Committee. Purchases of raw material by mills continue limited because of uncertainty regarding the ability of many manufacturers to continue existing operating schedules owing to reductions in orders previously booked. Quotations on the N. Y. Cotton Exchange for Middling Uplands follow:

	Mar. 10	April 10		
	Close	High	Low	Close
May	12.16	12.09	11.99	12.04
July	12.28	12.18	12.11	12.16
Oct.	——	12.32	12.24	12.29

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)

Peeler, carded, 23/4/3	.43¼	@	—
Peeler, carded, 23/5/3	.42¼	@	—
Peeler, carded, 13/3/3	.39¼	@	—
Peeler, carded, 15/3/3	.40¼	@	—
Egyptian, carded, 23/5/3	.52½	@	.53¼
Egyptian, combed, 23/5/3	.56	@	—
CHAFERS			
Carded, American, 1 1/16"	.38	@	.39
Carded, American, 1"	.33	@	.33½
LENO BREAKER			
Carded, American, 1 1/16"	.38		.39
Carded, American, 1"	.33	@	.33½

Sheetings

Count	Width	Weight			
48x40	36 in.	5.50 lb.	—	@	.05¾
40x40	36 in.	6.15 lb.	—	@	.05¼
40x36	36 in.	6.50 lb.	—	@	.05¼
48x48	40 in.	2.50 lb.	.11	@	.11⅛
48x48	40 in.	2.85 lb.	.09¾	@	.09⅞
64x68	40 in.	3.15 lb.	.10½	@	.10⅝
56x60	40 in.	3.60 lb.	—	@	.09⅛
48x44	40 in.	3.75 lb.	—	@	.07⅝
44x40	40 in.	4.25 lb.	—	@	.06¾

Ducks

Enameling	.34	@	—
Belting and Hose	.35	@	—
Single filling, A grade	.17¼	@	—
Double filling	.18¼	@	—

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 Tons

FROM MARCH 12 TO APRIL 10

Date	Spot	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Sales
Mar. 12	11.60	11.55	11.63	11.73	11.87	12.02	12.14	12.28	12.42	12.51	12.64	12.80	12.94	——	1238
13	11.70	11.66	11.73	11.81	11.97	12.14	12.28	12.42	12.55	12.67	12.80	12.93	13.06	——	1466
14	11.50	11.42	11.49	11.56	11.72	11.89	12.04	12.19	12.29	12.39	12.50	12.62	12.74	——	1040
15	11.50	11.45	11.52	11.60	11.75	11.91	12.07	12.23	12.34	12.44	12.55	12.66	12.77	——	644
16	11.30	11.18	11.25	11.33	11.49	11.65	11.80	11.96	12.06	12.16	12.28	12.40	12.52	——	816
17	11.25	11.13	11.20	11.28	11.43	11.58	11.72	11.87	11.99	12.10	12.21	12.33	12.45	——	185
18	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
19	10.75	10.66	10.74	10.82	10.97	11.14	11.27	11.41	11.53	11.64	11.76	11.86	11.97	——	859
20	11.00	10.92	10.99	11.07	11.23	11.39	11.54	11.70	11.82	11.92	12.02	12.13	12.24	——	649
21	10.87	10.77	10.84	10.92	11.07	11.23	11.33	11.46	11.57	11.68	11.80	11.92	12.04	——	657
22	10.90	10.85	10.92	11.00	11.14	11.29	11.43	11.59	11.70	11.80	11.90	12.01	12.12	——	392
23	10.85	10.75	10.82	10.90	11.05	11.20	11.33	11.47	11.59	11.69	11.80	11.90	12.02	——	238
24	11.00	11.00	11.05	11.11	11.25	11.40	11.55	11.70	11.82	11.92	12.02	12.12	12.22	——	234
25	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
26	10.94	10.91	10.95	11.00	11.15	11.31	11.43	11.56	11.68	11.79	11.90	11.97	12.07	——	412
27	10.75	10.78	10.83	10.91	11.05	11.20	11.33	11.47	11.59	11.69	11.80	11.91	12.02	——	395
28	10.82	10.79	10.84	10.92	11.06	11.21	11.34	11.47	11.59	11.69	11.80	11.91	12.02	——	181
29	11.00	——	11.03	11.11	11.27	11.43	11.56	11.70	11.82	11.92	12.03	12.14	12.25	——	400
30	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
31	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
Apr. 2	11.25	——	11.24	11.35	11.49	11.66	11.78	11.93	12.04	12.15	12.26	12.37	12.47	12.57	351
3	11.38	——	11.27	11.36	11.51	11.66	11.81	11.96	12.08	12.20	12.32	12.42	12.52	12.63	383
4	11.44	——	11.42	11.49	11.63	11.78	11.92	12.06	12.17	12.28	12.39	12.49	12.58	12.68	607
5	11.56	——	11.55	11.60	11.75	11.91	12.04	12.18	12.26	12.40	12.52	12.62	12.72	12.82	691
6	11.62	——	11.53	11.58	11.73	11.89	12.02	12.17	12.29	12.41	12.53	12.64	12.75	12.85	466
7	11.43	——	11.35	11.42	11.53	11.68	11.80	11.97	12.07	12.19	12.31	12.40	12.48	12.56	149
8	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
9	11.56	——	11.51	11.56	11.69	11.82	11.96	12.10	12.21	12.31	12.42	12.53	12.64	12.75	218
10	11.75	——	11.65	11.72	11.87	12.02	12.15	12.28	12.39	12.49	12.60	12.70	12.80	12.90	585

Rubber CHEMICAL Markets

NEW YORK, April 11, 1934

[All Quotations F.O.B. Works Unless Otherwise Noted]

ACCELERATORS

Organic			
A-1	lb.	.21 @	.25
A-5-10	lb.	.33 @	.36
A-7	lb.	.53 @	.65
A-11	lb.	.60 @	.75
A-16	lb.	.55 @	.65
A-19	lb.	.56 @	.75
A-32	lb.	.70 @	.80
Aldehyde ammonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.46 @	.47
Diphenylguanidine	lb.	.36 @	.37
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½ @	.42
Guantal	lb.	.42 @	.51
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.37 @	—
Lead Oleate, No. 999	lb.	.10 @	—
Witco	lb.	.10 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
Pipsol X	lb.	3.55 @	4.00
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R-2	lb.	1.55 @	1.90
R-2 Base	lb.	4.55 @	5.00
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Thiocarbanilid, drums	lb.	.20 @	.23
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.62 @	1.00
Ureka C	lb.	.58 @	.69
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.48 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.06¾ @	—
Magnesia, calcined, heavy	cwt.	4.00 @	4.50

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.36 @	.37
Ultramarine	lb.	.06 @	.10
Browns			
Sienna, Italian	lb.	.04 @	.08
Umber, Turkey	lb.	.04 @	.06
Greens			
Chrome, light	lb.	.23 @	.26
medium	lb.	.26 @	.28
dark	lb.	.28 @	.33
Chromium Oxide, bbl.	lb.	.23 @	.27
Reds			
Antimony			
crimson, 15/7	lb.	.45 @	—
sulfur, free	lb.	.48 @	.52
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.09¼ @	—
Whites			
Cryptone CB, No. 21	lb.	.06 @	.06¼
Cryptone, No. 19	lb.	.06 @	.06¼
Lithopone, Albalith	lb.	.04½ @	.04¾
Lithopone, Azolith	lb.	.04½ @	.04¾
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
XX Zinc Sulphide, bbls.	lb.	.11 @	.11¼
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾ @	.06
ZZ (leaded)	lb.	.05½ @	.05¾
Horsehead Lead Free Brand:			
Selected	lb.	.05¾ @	.06
Special	lb.	.05¾ @	.06
XX Red	lb.	.05¾ @	.06
XX	lb.	.05¾ @	.06
XX Green	lb.	.05¾ @	.06
Leaded Brand, Standard	lb.	.05½ @	.05¾
Sterling	lb.	.05½ @	.05¾
Superior	lb.	.05½ @	.05¾
Lehigh	lb.	.05¼ @	.05½
U. S. P., bbls.	lb.	— @	.12¾
Kadox, black label	lb.	.09½ @	.09½
Blue label	lb.	.08½ @	.08½
Red label	lb.	.07 @	.07¼
St. Joe, black label	lb.	.05¾ @	.06
green label	lb.	.05¾ @	.06
red label	lb.	.05¾ @	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾ @	.06
Anaconda, selected lead free	lb.	.06¼ @	.06½
Florence White seal, bbls.	lb.	— @	.10¾
Green seal	lb.	.09¼ @	.09½
Red seal	lb.	.08¾ @	.08¾
Yellows			
Chrome	lb.	.16 @	.16¼
Ocher, dom. med.	lb.	.01½ @	.02

BLACKS

Arrow "Aerfloted" Specification	lb.	.0535 @	.0825
Bone, powdered	lb.	.05½ @	.12½
Carbon, compressed	lb.	.0535 @	.0825
uncompressed	lb.	.0535 @	.0825
"Certified," Cabot	lb.	.0535 @	.0825
Spherons	lb.	.0535 @	.0825
"Disperso"	lb.	.0535 @	.0825
Drop, bbls.	lb.	.05½ @	.14
"Excello," compressed	lb.	.0535 @	.0825
"Fumonex"	lb.	.03 @	.07
"Gastex"	lb.	.03 @	.07
Lampblack	lb.	.06 @	.08
"Micronex"	lb.	.0535 @	.0825
"Supreme"	lb.	.0535 @	.0825
Thermatomic—"P 33"	lb.	— @	—
"Thermax"	lb.	— @	—
United "Dixie" & "Kosmos"	lb.	.0535 @	.0825

COMPOUNDING MATERIALS

Aluminum Flake	ton.	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	14.00 @	—
Barium carbonate (98-100%)	ton	56.50 @	61.50
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	10.00 @	18.00
Western prime white	ton	23.00 @	—
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	70.00 @	75.00
Calcene	ton	35.00 @	45.00
Carrara filler	lb.	.01¾ @	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	75.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	7.50 @	15.00
Aerfloted, Suprex	ton	7.50 @	10.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Par	ton		
Tensulite		15.00 @	—
Cotton Flock	lb.	.10½ @	.18
Glues, extra white	lb.	.15 @	.22
medium white	lb.	.12 @	.14
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesia, carbonate	lb.	.06 @	.06¾
Mica	lb.	.04 @	—
Rottonstone (powdered)	ton	23.50 @	28.00
Soapstone, powdered	ton	16.00 @	18.00
Starch, powdered	cwt.	2.50 @	2.60
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.10
English cliffstone	cwt.	1.50 @	1.70
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.10½ @	—
Zinc Stearate	lb.	.23 @	—

MINERAL RUBBER

Genasco (factory)	ton	30.00 @	32.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	23.00 @	28.00
Pioneer, MR, solid	ton		
Pioneer-granulated	ton		

SPECIALTIES

Aromatics—Rodo	lb.		
Para-Dors No. 5145	lb.	2.00 @	—
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.80
Tonox	lb.	.56 @	.60

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.55 @	1.80
Tartaric, crystals	lb.	.23½ @	—
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08 @	.12
Stearic, double pressed	lb.	.08 @	.12
Alkalies			
Caustic Soda, 76%	cwt.	3.60 @	—
Soda Ash, 58% C.L.	cwt.	2.52 @	—
Oils			
Corn, refined, bbls.	lb.	— @	.06¾
Cottonseed, crude	gal.	— @	.04
Cycline Oil	gal.	.15 @	.28
Degras (c.l. 100 bbls.)	lb.	.02¾ @	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¼ @	—
Fluxrite	lb.	.05½ @	.06½
Palm Lagos	lb.	.04¾ @	—
Niger	lb.	.02¾ @	.03
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.02½ @	—
Pigmentaroil, tank cars	gal.	.14 @	—
in drums	gal.	.20 @	.21½
Pine, steam distilled	gal.	.59 @	.61
dest. dist., drums	gal.	.50 @	.53
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.07½ @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Wobonite, c.l.	lb.	.05 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.05¼ @	.06
pine, 200 lb. gr. wt.	bbl.	6.00 @	—
Rosin, grade K, 290 lb.	bbl.	5.50 @	—
Pigmentar, tank cars	gal.	.14 @	—
in drums	gal.	.20 @	.21½
Tar Retort, drums	bbl.	10.00 @	11.00
Solvents			
Acetone, pure	lb.	.11 @	—
Alcohol, denatured,			
No. 1 bbls.	gal.	.30½ @	.41½
Benzol, 90%	gal.	— @	.27
Bondogen	lb.	— @	—
Carbon, bisulfide	lb.	.05 @	.06
Carbon, tetrachloride	lb.	.06 @	—
Dichlorethylene	lb.	.29 @	—
Dipentene	gal.	.31 @	.41
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05½ @	.06½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.31
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.55 @	—
wood	gal.	.50 @	—
dest. dist., drums	gal.	.43 @	.45
Waxes			
Beeswax, white	lb.	.30 @	.32
Carnauba	lb.	.25 @	.26
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.05 @	.06
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02⅜ @	.03½
White crude scale 124/126	lb.	.02 @	.02½
Refined, 125/127, 138/140	lb.	.03 @	.07

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Flectol-A and Flectol B	lb.	.54 @	.62
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.52 @	.65
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

MOLD LUBRICANTS

Dipex	lb.	.06 @	.08
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Zip	lb.	— @	—

SUBSTITUTES (FACTICE)

Amberex	lb.	.13¾ @	—
Black	lb.	.08½ @	—
White	lb.	.08 @	.12
Brown	lb.	.07 @	.11½

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½ @	.04
Sulfur flour.			
Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	427,280
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
Sept.	28,956	1,774,403	2.73	2,388	241,960	4.54	26,568
Oct.	35,096	2,436,522	3.10	1,059	98,022	4.13	34,037
Nov.	28,908	2,263,469	3.48	1,745	158,618	4.06	27,163
Dec.	31,384	2,360,061	3.34	770	66,165	3.98	30,614
1933:							
Jan.	29,822	2,213,828	3.03	1,403	109,916	3.49	28,419
Feb.	22,603	1,554,086	3.12	1,244	102,129	3.73	21,359
Mar.	27,936	1,867,657	2.98	1,127	86,216	3.42	26,809
April	20,240	1,291,136	2.85	798	70,111	3.92	19,442
May	26,002	1,694,963	2.93	1,842	189,451	4.59	24,894
June	22,900	1,780,495	3.47	1,276	156,168	5.46	21,624
July	44,625	4,293,111	4.29	1,419	219,945	6.92	43,206
August	44,257	5,391,709	5.44	2,205	302,132	6.12	42,052
Sept.	44,912	6,110,956	6.07	2,369	335,798	8.89	42,543
Oct.	44,474	6,115,330	6.14	2,669	397,167	6.64	41,805
Nov.	40,582	5,850,714	6.44	2,188	333,631	6.81	38,394
Dec.	39,461	5,869,556	6.75	1,888	293,690	6.94	37,573
1934:							
Jan.	47,963	7,403,123	6.89	1,975	352,116	7.96	45,988
Feb.	34,335	5,262,711	6.84	2,133	476,232	9.97	32,202

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex (1) Tons	Liquid Latex (1) Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1933	—	—	1,658	2,261,869	5,989	944,895	11,085	1,833,671
1933:								
Feb.	—	—	12	2,923	391	52,171	367	46,037
Mar.	—	—	45	11,963	437	56,262	539	55,731
April	—	—	7	2,054	210	26,856	794	80,794
May	—	—	35	9,869	463	55,560	734	71,008
June	—	—	759	1,514,296	466	61,229	604	66,827
July	—	—	238	76,141	638	79,049	618	85,636
Aug.	—	—	272	527,147	390	55,509	1,156	196,138
Sept.	—	—	65	30,738	761	149,296	1,343	267,516
Oct.	—	—	119	47,663	542	99,249	1,561	310,531
Nov.	—	—	31	11,252	626	125,160	1,239	282,065
Dec.	—	—	42	20,008	708	143,868	1,290	270,533
1934:								
Jan.	—	—	98	43,932	766	169,966	1,126	239,054
Feb.	—	—	68	36,346	453	102,471	885	193,732

(1) Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1927	1928	1929	1930	1931	1932	1933	1934
Jan.	31,518	34,403	43,002	36,194	28,557	29,648	21,661	40,413
Feb.	30,137	33,702	41,594	33,302	28,797	31,821	21,638	40,609
Mar.	36,141	35,688	44,730	35,540	32,788	29,505	18,047	.....
Apr.	35,871	32,772	47,521	39,686	33,321	27,515	26,226	.....
May	34,592	37,333	49,233	39,386	37,817	30,957	44,580	.....
June	33,801	37,676	43,227	34,195	37,916	41,475	51,326	.....
July	29,219	37,407	41,526	29,508	31,397	29,976	50,184	.....
Aug.	33,460	42,927	38,274	30,850	27,586	23,721	44,939	.....
Sept.	27,214	39,882	34,707	25,515	23,638	23,847	35,686	.....
Oct.	26,790	40,857	34,800	27,516	22,277	22,286	31,906	.....
Nov.	26,792	37,461	27,659	23,691	22,943	23,231	29,162	.....
Dec.	25,492	31,232	25,531	21,687	21,409	18,015	29,087	.....
Tot.	371,027	441,340	469,804	375,980	348,986	332,000	405,689	.....

Figures on Quarterly Basis

Quarter	1926	1927	1928	1929	1930	1931	1932	1933
Jan./Mar.	94,301	99,216	103,558	128,565	101,610	89,652	85,309	64,326
Apr./June	87,109	103,242	103,500	139,292	112,229	107,755	92,643	125,126
July/Sept.	93,793	89,210	117,573	113,746	85,261	83,632	72,523	132,406
Oct./Dec.	83,212	80,860	117,597	84,872	72,020	65,645	64,145	94,198
Totals	358,415	372,528	442,227	466,475	371,120	346,684	314,620	416,056

Note—The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1923	74,766	69,534	22.7	.....
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,213
1927	189,144	178,471	47.6	24,980
1928	208,516	223,000	50.4	24,785
1929	218,954	226,588	48.4	27,464
1930	157,967	153,497	40.8	22,000
1931	133,351	124,126	33.9	19,257
1932	75,608	77,504	23.4	16,354
1933:				
Jan.	5,301	4,811	21.0	16,262
Feb.	4,578	4,363	20.2	16,570
Mar.	3,847	3,454	19.1	15,496
Apr.	4,617	4,407	16.8	14,370
May	8,366	7,770	17.4	13,734
June	10,591	9,674	18.8	13,231
July	12,049	10,317	20.6	14,108
Aug.	11,708	9,446	21.0	15,037
Sept.	10,435	7,862	22.0	15,869
Oct.	9,466	7,212	22.6	17,748
Nov.	9,063	6,335	21.7	19,170
Dec.	9,539	5,951	20.5	20,746
1934:				
Jan.	9,828	7,000	17.3	24,263
Feb.	9,504	7,646	18.8	23,356
Mar.	....	....	...	...
Apr.	....	....	...	....
May	....	....	...	....
June	....	....	...	....
July	....	....	...	....
Aug.	....	....	...	....
Sept.	....	....	...	....
Oct.	....	....	...	....
Nov.	....	....	...	....
Dec.	....	....	...	....

* Stocks on hand at the end of month or year.
(Rubber Manufacturers' Association figures raised to 100%)

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1932	1933	1934		1932	1933	1934
January	26,038	26,510	29,519	August	35,706	37,426	.....
February ...	25,378	23,312	24,947	September ..	33,828	34,303	.....
March	29,597	28,227	.....	October	32,680	32,973	.....
April	31,234	30,176	.....	November ..	29,895	30,262	.....
May	32,016	33,999	.....	December ..	27,110	28,787	.....
June	39,489	37,710	.....				
July	30,929	34,458	.....	Total	373,900	378,143	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market. in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1932																																
January	—	—	—	4½	4½	4½	4½	4¾	4¾	—	4½	4½	4¾	4¾	4½	4½	—	4½	4⅜	4⅜	4⅜	4⅜	4⅜	—	4¼	4¼	4⅜	4⅜	—	—	—	4⅜
February	4⅜	—	4⅛	4⅛	4⅛	4⅜	4⅜	4⅜	4⅜	4	4	4	4⅛	4⅛	4	4	—	4	4	4	4	4	4	4	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	—	4
March	3½	—	3½	3½	3½	3⅜	3⅜	3½	3½	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜
April	3	—	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	—	—	3¼	3¼	3¼	4	4⅛	—	4	3⅞	3⅞	3⅞	3	3	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	3⅛	3⅛	3⅛	2⅞	3	3	3	3	3	3	3	3⅛
June	2¾	—	2¾	2¾	2¾	2⅝	2⅝	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2½	2⅝	2⅝	2¾	2¾
July	2⅝	—	2¾	2¾	2⅝	2⅝	2⅝	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	3	3	3	2½	2⅝	2⅝	2¾	2¾
August	3¼	—	3¼	3⅜	3⅜	3⅜	3⅜	3½	3½	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜
September	4¼	—	4¼	4¼	4¼	4⅛	4⅛	4⅛	4⅛	4	4	4	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	4	4	4	4	4½	4⅜	4⅜	4⅛
October	3¼	—	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
November	3⅛	—	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
December	3⅛	—	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
1933																																
January	—	2⅛	3¼	3⅛	3⅛	3¼	2⅛	—	3⅛	3⅛	3¼	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	2⅞	2⅞	2⅞	2⅞	—	3	3⅛	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	3
February	2⅛	3	3⅛	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	—	3	3⅛	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	3
March	3	—	2⅞	3	4⅛	3⅞	3⅞	3⅞	4⅛	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞	3⅞
April	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May	4⅛	—	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛
June	6⅛	—	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛
July	7⅛	—	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛
August	7⅛	—	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛
September	7⅛	—	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛
October	7⅛	—	7⅛	7⅛	7⅛	7⅛	7⅛	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
November	7⅞	—	7⅞	8	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛
December	9¼	—	8	9¼	9⅛	8⅛	9⅛	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	9	9	9	8⅝
1934																																
January	9	9	8⅛	9	9	9	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10⅜	10	10	9⅝
February	9⅞	9	9⅛	10½	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10	10	10½
March	10⅛	10⅛	10½	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11	11	11
April	11¼	11¼	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜	11⅜

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1927

Month	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents	1934 Cents
Jan.	40.25	20.14	15.24	8.34	4.38	3.08	9.32
Feb.	32.75	23.97	15.85	7.70	4.03	2.95	10.45
Mar.	26.82	24.55	15.34	7.71	3.35	3.01	11.01
Apr.	18.97	21.18	14.93	6.43	3.02	3.56	....
May	18.99	21.46	14.24	6.49	3.09	4.95	....
June	19.59	20.64	12.45	6.35	2.66	6.15	....
July	19.40	21.30	11.24	6.37	2.89	8.01	....
Aug.	19.46	20.59	9.96	5.38	3.63	7.31	....
Sept.	18.47	20.37	8.28	5.08	3.84	7.30	....
Oct.	18.83	19.67	8.20	4.87	3.65	7.64	....
Nov.	18.26	16.62	9.01	4.65	3.44	8.66	....
Dec.	17.97	16.12	9.05	4.64	3.24	8.87	....
Average for Year	22.48	20.55	11.98	6.17	3.49	5.96	....

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Jan.	Feb.	Mar.	Apr.	Day	Jan.	Feb.	Mar.	Apr.
1	—	4 13/32	4 13/32	—	17	4 3/8	4 13/32	5 1/16	
2	4 3/8	4 13/32	4 13/32	—	18	4 1/2	—	—	
3	4 1/4	4 3/4	4 13/32	5 7/32	19	4 1/2	4 13/32	5 1/16	
4	4 7/32	—	—	5 1/16	20	4 13/32	4 13/32	5 1/32	
5	4 1/4	4 13/32	5	5 1/16	21	—	4 7/8	5 1/16	
6	4 5/32	4 13/32	5 1/32	5 3/8	22	4 13/32	4 13/32	5 1/16	
7	—	4 13/32	5 1/16	5 3/8	23	4 1/2	5	5 1/32	
8	4 7/32	4 13/32	5 7/32	—	24	4 13/32	5	5 1/32	
9	4 5/32	5	5 1/16	5 3/8	25	4 5/8	—	—	
10	4 1/4	5 3/32	5 1/16	5 3/8	26	4 13/32	4 13/32	5 7/32	
11	4 1/4	—	—		27	4 13/32	4 13/32	5 1/16	
12	4 7/32	4 7/16	5 3/16		28	—	4 13/32	5 1/32	
13	4 7/32	4 13/32	5 3/16		29	4 13/32	—	5 1/16	
14	—	4 13/32	5 1/4		30	4 13/32	—	—	
15	4 3/16	4 13/32	5 5/16		31	4 13/32	—	—	
16	4 1/4	4 13/32	5 5/16						

Average Monthly Price Per Pound

Month	1931 Pence	1932 Pence	1933 Pence	1934 Pence	Month	1931 Pence	1932 Pence	1933 Pence	1934 Pence
Jan.	4.160	3.052	2.264	4.429	Aug	3.385	2.654	3.811	
Feb.	3.823	2.760	2.093	4.920	Sept.	2.524	2.485	3.728	
Mar.	3.822	2.047	2.099	5.136	Oct.	2.898	2.425	3.957	
Apr.	3.082	1.876	2.323		Nov.	2.890	2.518	4.096	
May	3.035	1.825	2.966		Dec.	3.115	2.444	4.200	
June	3.082	1.750	3.392		Average for Year	3.155	2.434	3.233	
July	3.048	1.875	3.860						

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	Feb.	Mar.	Apr.	Date	Feb.	Mar.	Apr.	Date	Feb.	Mar.	Apr.
1	11.75	12.20	——	11	——	——		21	12.40	12.15	
2	11.80	12.50	12.15	12	——	12.50		22	——	12.15	
3	11.95	12.40	12.20	13	12.45	12.45		23	12.40	12.10	
4	——	——	12.25	14	12.40	12.45		24	12.40	12.25	
5	11.95	12.45	12.20	15	12.45	12.45		25	——	——	
6	12.15	12.35	12.30	16	12.55	12.35		26	12.10	12.20	
7	12.25	12.30	12.25	17	12.55	12.35		27	12.15	12.05	
8	12.45	12.45	——	18	——	——		28	12.15	12.00	
9	12.55	12.40	12.15	19	12.40	12.20		29	——	12.20	
10	12.65	12.35	12.25	20	12.30	12.30		30	——	——	
								31	——	——	

Average Monthly Price Per Pound

	1931 Cents	1932 Cents	1933 Cents	1934 Cents		1931 Cents	1932 Cents	1933 Cents	1934 Cents
Jan.	10.27	6.65	6.23	11.25	Aug.	7.21	7.43	9.55	
Feb.	10.96	6.85	6.05	12.28	Sept.	6.52	6.30	9.64	
Mar.	10.90	6.86	6.39	12.30	Oct.	6.32	6.30	9.58	
Apr.	10.19	6.16	7.02		Nov.	6.44	6.22	10.04	
May	9.38	5.72	8.64		Dec.	6.25	6.00	10.17	
June	9.05	5.02	9.47		Average for Year	8.56	6.41	8.63	
July	9.28	5.87	10.76						

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND			AFLOAT			ON HAND AND AFLOAT		
	1932	1933	1934	1932	1933	1934	1932	1933	1934
Jan.	322,860	396,376	368,660	42,234	32,539	45,768	365,094	428,915	414,428
Feb.	318,936	381,794	357,094	51,728	32,898	53,063	370,604	414,692	410,157
Mar.	329,586	390,135		44,190	29,531		373,776	419,666	
Apr.	336,957	382,167		40,387	30,745		377,344	412,912	
May	336,719	364,623		50,453	43,342		387,172	407 965	
June	334,657	333,954		43,079	63,608		377,736	397,562	
July	333,729	326,609		37,894	57,435		371,623	384,044	
Aug.	342,888	325,148		42,846	53,084		385,734	378,232	
Sept.	346,154	334,637		46,188	57,255		342,342	391,892	
Oct.	358,282	343,579		40,176	58,568		398,458	402,147	
Nov.	360,386	353,852		40,879	57,140		401,265	410,992	
Dec.	379,000	364,541		38,360	55,606		417,360	419,147	

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1932	1933	1934	At end of	1932	1933	1934
Jan.	67,166	36,481	38,570	July	48,842	41,178	
Feb.	65,942	37,182	38,752	Aug.	47,079	39,480	
Mar.	64,280	40,845		Sept.	44,942	39,237	
Apr.	61,848	40,911		Oct.	42,327	37,101	
May	56,089	41,998		Nov.	40,606	36,139	
June	51,009	43,032		Dec.	37,407	35,615	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1933					
October	38,935	38,565	38,457	37,898	
November	37,170	36,831	36,443	36,360	
December	36,165	35,853	35,970	35,643	35,777
1934					
January	36,478	37,326	38,333	38,537	
February	39,064	39,509	40,133	39,775	
March	39,680	39,670	40,174	40,178	40,480
April	40,994				

Stocks in Liverpool

1933				
October	54,899	54,134	53,500	52,969	
November	52,818	52,910	52,466	52,418	
December	51,894	51,803	51,954	51,206	51,014
1934					
January	51,434	51,897	52,256	52,037	
February	51,937	52,615	52,920	52,944	
March	52,832	53,488	53,929	54,109	54,004
April	54,464				

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1931	1932	1933	1934	End of	1931	1932	1933	1934
Jan.	48,802	48,850	22,525	40,405	July	51,203	17,017	36,972	
Feb.	49,283	46,954	21,530	41,884	Aug.	48,971	20,649	38,601	
Mar.	49,590	46,591	24,594		Sept.	47,025	20,415	36,948	
Apr.	45,868	39,663	25,460		Oct.	52,132	23,158	37,282	
May	44,278	38,690	29,822		Nov.	46,947	25,419	39,018	
June	47,517	19,770	34,676		Dec.	45,795	25,341	38,269	

STOCKS IN OTHER CENTRES

End of:	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Jan., 1933	38,844	25,080	2,143	4,662	5,676
Feb.	37,323	28,540	2,033	4,210	6,006
Mar.	33,494	26,180	2,183	3,779	5,780
Apr.	33,391	27,710	2,214	3,428	5,204
May	32,613	24,090	1,534	3,177	4,790
June	35,919	22,930	1,147	2,913	4,321
July	35,020	22,900	1,007	3,208	3,830
Aug.	36,756	22,000	1,033	3,411	3,588
Sept.	36,083	25,900	1,107	4,286	3,288
Oct.	37,302	28,320	1,411	4,889	3,237
Nov.	36,965	38,530	1,285	5,575	3,383
Dec.	38,441	36,700	1,052	5,792	2,981
Jan. 1934	36,788	35,000	1,115	7,271	3,305
Feb.	39,630	35,000			

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1924	21,863,311	1928	24,247,282	1932	6,261,336
1925	26,001,664	1929	24,141,502	1933	8,713,962
1926	24,199,524	1930	17,364,096	1934	.....
1927	19,700,003	1931	11,253,800	1935	.....
1934:		1934:		1934:	
January	789,274	May	.....	September	.....
February	1,262,311	June	.....	October	.....
March	1,651,548	July	.....	November	.....
April	.....	August	.....	December	.....

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1926	1927	1928	1929	1930	1931	1932	1933
Production	61,237	64,439	77,944	68,726	50,965	48,739	40,085	45,304
Shipments	59,002	64,059	74,296	69,395	53,638	48,151	40,260	44,094
Inventory [2]	10,456	10,264	13,624	11,838	9,003	7,775	7,644	8,888

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1931	1932	1933	1931	1932	1933	1931	1932	1933
Jan.	3,675	3,462	2,258	3,744	3,253	2,597	8,957	7,912	7,237
Feb.	3,985	3,871	2,339	3,402	2,553	2,292	9,536	9,172	7,377
Mar.	4,663	3,671	2,038	4,122	2,954	2,092	10,014	9,878	7,290
Apr.	4,944	3,517	3,123	4,932	3,698	3,654	10,031	9,846	6,778
May	5,679	3,820	5,189	5,415	4,258	5,180	10,312	9,379	6,760
June	5,672	5,643	6,100	5,572	10,065	6,305	10,447	4,999	6,615
July	4,926	3,617	5,714	5,462	2,404	5,497	9,919	6,203	6,844
Aug.	3,906	3,089	4,994	4,960	2,655	4,707	8,896	6,659	7,070
Sept.	3,172	2,539	3,999	3,932	3,082	3,503	8,158	6,096	7,595
Oct.	2,974	2,569	3,429	2,852	1,799	2,537	8,300	6,876	8,462
Nov.	2,500	2,304	3,039	2,887	1,711	2,197	7,919	7,454	9,247
Dec.	2,643	1,983	3,082	2,781	1,819	3,531	7,775	7,644	8,888

NOTE: January and February, 1934, Tire and Tube Statistics will not be available until about April 20.—[Ed.]

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1926	1927	1928	1929	1930	1931	1932	1933
Production	76,618	70,823	80,180	68,829	52,420	48,333	36,891	42,546
Shipments	71,591	72,896	77,127	70,592	54,938	50,021	37,911	41,391
Inventory [2]	16,200	13,692	16,117	12,807	9,999	7,922	6,749	7,815

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1931	1932	1933	1931	1932	1933	1931	1932	1933
Jan.	3,623	3,308	2,093	4,062	3,529	2,535	9,439	7,719	6,197
Feb.	3,916	3,281	2,224	3,400	2,728	2,102	9,921	8,760	6,357
Mar.	4,450	3,502	1,883	3,789	2,686	1,902	10,475	9,448	6,369
Apr.	4,617	3,225	2,853	4,636	3,385	3,051	10,413	9,441	6,189
May	5,413	3,409	4,700	5,281	3,867	4,463	10,459	8,913	6,382
June	5,358	5,279	5,448	5,397	9,019	5,778	10,504	5,174	6,097
July	4,955	2,937	5,603	5,831	2,160	5,211	9,589	5,975	6,440
Aug.	4,435	2,748	4,916	5,301	2,503	4,687	8,774	6,127	6,628
Sept.	3,449	2,601	3,827	4,150	3,098	3,472	8,095	5,753	7,008
Oct.	3,077	2,187	3,506	2,813	1,658	2,676	8,321	6,214	7,831
Nov.	2,443	2,005	2,863	2,594	1,578	2,103	8,119	6,662	8,625
Dec.	2,597	1,779	2,631	2,767	1,724	3,410	7,922	6,749	7,815

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933*	1,959,945	1,606,703	353,242	65,924	53,855	12,069	2,025,869
1933*							
Jan.	130,087	108,326	21,761	3,358	2,921	437	133,445
Feb.	106,888	91,492	15,396	3,298	3,025	273	110,186
Mar.	118,002	99,885	18,117	6,632	5,927	705	124,634
Apr.	180,713	153,350	27,363	8,255	6,957	1,298	188,968
May	218,347	184,698	33,649	9,396	8,024	1,372	227,743
June	253,387	211,483	41,904	7,323	6,005	1,318	260,710
July	233,141	195,023	38,118	6,540	5,322	1,218	239,681
Aug.	236,556	195,144	41,412	6,079	4,919	1,160	242,635
Sept.	196,143	160,900	35,243	5,808	4,358	1,450	201,951
Oct.	138,542	108,073	30,469	3,682	2,723	959	142,224
Nov.	63,987	44,429	19,558	2,291	1,503	786	66,278
Dec.	84,152	53,900	30,252	3,262	2,171	1,091	87,414
1934							
Jan.	161,086	116,353	44,733	6,904	4,946	1,958	167,990
Feb.	235,376	190,280	45,096	8,571	7,101	1,470	243,907

* Revised.

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA [1]							DUTCH EAST INDIES [5]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon [2]	India & Burma [3]	Sarawak [4]	British North Borneo [3]	Siam [4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China [3]	Amazon Valley	All Other [6]	World Total [7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,296	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1932:															
Aug.	39,327	7,371	31,956	4,717	129	506	400	300	4,803	4,882	7,244	1,086	303	49	56,377
Sept.	41,973	8,869	33,104	5,238	122	614	400	340	3,858	6,485	7,664	1,621	318	78	59,733
Oct.	37,931	9,798	28,133	2,945	139	583	350	428	4,022	7,051	8,944	1,147	414	247	54,403
Nov.	40,098	10,072	30,026	4,146	185	683	350	371	4,368	6,250	9,080	805	1,164	156	57,588
Dec.	40,118	10,089	30,029	5,801	367	644	350	406	4,683	7,066	8,594	1,211	824	150*	59,493
1933:															
Jan.	46,599	7,857	38,742	4,602	318	590	458	305	4,766	5,630	6,840	1,957	554	125*	58,887
Feb.	37,564	6,167	31,397	5,064	304	541	458	368	4,895	5,119	6,081	895	620	125*	55,867
Mar.	42,059	7,964	34,095	4,905	389	571	458	304	5,092	6,466	6,999	1,102	995	125*	61,501
Apr.	36,752	7,758	28,994	4,582	272	624	583	235	5,226	5,969	8,147	1,122	556	125*	56,435
May	42,902	13,664	29,238	4,643	475	1,091	583	359	6,782	7,298	13,195	1,371	918	125*	66,078
June	41,411	16,538	24,873	5,198	377	1,149	582	632	7,352	6,654	14,779	1,369	704	125*	63,794
July	50,531	18,772	31,759	4,201	270	1,358	728	797	7,367	8,580	16,534	1,310	913	125*	73,942
Aug.	52,266	17,869	34,397	5,839	246	955	728	926	6,460	7,985	15,161	808	1,116	125*	74,746
Sept.	49,607	15,146	34,461	5,111	125	1,027	728	611	5,868	9,164	15,005	1,702	656	125*	74,452
Oct.	61,002	17,390	43,612	5,674	271	959	750*	976	6,329	8,692	15,170	1,513	965	125*	84,879
Nov.	54,599	20,142	34,457	6,097	516	1,020	750*	1,191	6,684	9,951	14,474	1,599	956	125*	77,820
Dec.	57,579	18,110	39,469	7,062	964	989	750*	1,046	7,030	10,183	17,274	2,173	930	125*	87,995
1934:															
Jan.	55,276	21,184	34,092	7,551	1,531	1,197	750*	1,290	6,513	8,974	17,718	2,158	576	125*	82,475
Feb.	57,963	19,688	38,275	8,354	.....	1,005	750*	1,264	6,706	10,277	17,466	1,100	.....	125*	.....
Mar.	.....	.....	.....	6,954	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons in 1924, 6 tons in 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons in 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. * Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,88b	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,176	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,49b	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,50b	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1932:															
Oct.	34,748	2,927	4,715	4,177	1,207	5,653	510	1,853	569	627	553	537	489	986	59,551
Nov.	27,689	4,950	3,830	3,577	1,593	4,563	1,265	1,481	1,653	1,035	275	489	631	650	53,681
Dec.	31,246	1,182	3,205	4,623	941	5,603	2,103	3,720	745	1,298	348	544	485	2,602	57,645
1933:															
Jan.	29,260	3,277	5,858	4,241	1,189	7,611	3,005	1,558	1,275	1,388	308	640	252	838	60,700
Feb.	22,970	7,102	6,603	4,460	1,175	8,508	994	2,820	2,001	1,670	375	564	132	681	60,055
Mar.	27,348	8,883	6,093	4,425	1,114	6,035	1,604	2,088	1,904	952	282	649	340	688	62,405
Apr.	20,236	7,765	6,308	4,805	555	5,495	2,215	2,274	1,580	882	163	606	281	400	53,565
May	24,894	11,085	4,144	4,622	1,704	5,289	1,278	1,691	425	710	—525	536	433	432	56,718
June	22,228	8,739	4,056	3,639	1,441	3,330	1,997	2,000	613	469	—519	772	541	400	49,706
July	43,824	3,961	3,774	4,103	1,192	1,460	1,146	2,952	2,347	299	16	486	435	287	66,282
Aug.	43,208	4,330	5,25a	4,193	1,795	4,426	1,249	3,312	1,500	325	209	616	606	2,759	73,779
Sept.	43,886	4,341	4,111	5,84.	2,620	5,369	2,055	2,168	794	864	189	604	790	577	74,211
Oct.	43,366	3,373	4,921	4,772	2,580	6,150	1,836	2,085	604	1,118	310	777	44.	686	73,081
Nov.	39,633	3,955	5,419	4,086	2,184	6,296	942	4,483	301	1,129	222	878	493	882	70,903
Dec.	38,864	6,524	5,415	4,933	1,773	6,865	1,029	2,400	190	1,360	213	703	776	1,772	72,817
1934:															
Jan.	47,114	9,503	6,843	6,057	1,721	5,628	.....	.....	566	2,173	381	1,185	484	1,355	.....
Feb.	33,087	10,785	7,373	5,490	1,854	.....	.....	.....	.....	.....	287	.....	.....	.....	.....

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1] United States imports of guayule are included in this compilation. * Figure is provisional; final figure will be shown immediately it becomes available.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Chemicals and Compounding Materials —

ACCELERATORS—
Ureka C—Ureka Blend B—Ureka.—A-1, A-7, A-11, A-16, A-19, A-32, Z-88, A-510, DPG
ANTIOXIDANTS — Flectol A, Oxynone
The RUBBER SERVICE Laboratories Co.
611 Peoples Sav. & Trust Bldg., Akron, O.
A Division of MONSANTO Chemical Wks.

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.
Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

ASBESTINE—Specially prepared for use in Rubber. Send for liberal working samples.
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41 Park Row New York City

CARBON BLACK—*Micronex* the world's standard gas black, universally known as the "King of Rubber Pigments."
Binney & Smith Co.
41 East 42nd St. New York City

CABOT CERTIFIED CARBON BLACK
"Spheron"
Godfrey L. Cabot, Inc.
940 Old South Bldg., Boston, Mass.

CARBON BLACK—*Aerfloted*
Arrow Black for rubber compounding. Standard for grit-free uniformity.
J. M. Huber, Inc.
460 West 34th St. New York

CARBON BLACK
SUPREME—*the up-to-date standard for rubber*
Imperial Oil & Gas Products Co.
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The Naugatuck Chemical Co.
1790 BROADWAY NEW YORK

CHEMICALS and compounding ingredients; Clay, Accelerators, Mineral Rubber.
R. T. Vanderbilt Co.
230 Park Ave. New York City

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245 Front St., New York

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COLLOIDAL ZINC OXIDE
COLLOIDAL COLORS
Heveatex Corporation
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Fine organic colors—Reds, Blues, Oranges, Violets, Greens—or any shade to meet your requirements—also Rubber Dispersed Colors
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A neutral gum for rubber compounding.
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